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The aggravation and mitigation of mass gathering-associated health risks: a social  
identity perspective

Anna Katarina Daniella Hult Khazaie

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## **Abstract**

Research and practice have tended to focus on physical factors in the aggravation and mitigation of mass gathering-associated health risks while largely neglecting the importance of psychosocial factors. This thesis sought to advance the understanding of the aggravation and mitigation of mass gathering-associated health risks through a social identity perspective and employed a systematic mixed methods research strategy entailing five studies. A systematic review of the literature on the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gatherings confirmed that the literature is limited. An experimental vignette study and a cross-sectional survey study demonstrated that perceiving a shared identity with other crowd members lowers health risk perceptions via lowered perceived disgust. A systematic scoping review of the literature on the negative implications of social identity processes for health risk perceptions and behaviours in non-mass gathering settings identified processes that may underpin the negative social identity-health risk relationship in mass gatherings: engagement with unhealthy norms brought about by normative pressure and the affirmation of social identities. Finally, a qualitative interview study with mass gathering healthcare professionals (HCPs) indicated that HCPs recognise that processes, such as norms and identity enactment, are implicated in mass gathering-associated health risks. HCPs also perceive value in drawing on social identity processes to inform and improve healthcare practices and interventions. This thesis has provided empirical evidence for the negative relationship between social identification and health risk perceptions and behaviours in mass gatherings and unearthed social identity processes that underpin the relationship. It has also provided theoretically and empirically grounded recommendations for the incorporation of social identity processes into mass gathering health interventions.

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*"The roots of education are bitter, but the fruit is sweet."*

## **Author Contribution Statement**

Chapter 5 and 7 present studies that have been published as peer-reviewed journal articles (see 'Published Journal Articles' below for full references). The published articles have been co-authored with the primary supervisor of the PhD project, Dr Sammyh Khan (SK; Chapter 5 and 7), and the secondary supervisor Professor Clifford Stott (CS; Chapter 7).

For Chapter 5, Daniella Hult Khazaie (DHK; author of this thesis) conceptualised and planned the research, with the support of SK. DHK carried out the studies, conducted the formal data analysis, and wrote the original draft of the manuscript. DHK and SK reviewed and edited the final draft.

For Chapter 7, DHK conceptualised and planned the research, with the support of SK. DHK carried out the study, conducted the formal data analysis, and wrote the original draft of the manuscript. SK and CS reviewed the analysis to ensure credibility. DHK, SK, and CS reviewed and edited the final draft.

### **Published Journal Articles**

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## **CHAPTER 1: An Introduction to Mass Gatherings and Health Risks**

### **Chapter Overview**

Chapter 1 and the preceding introductory chapter present literature relevant to the thesis, building a foundation for the research questions to be investigated in the empirical chapters. This chapter, in particular, will define mass gatherings, providing examples of their nature and magnitude. The mass gathering-associated health risks will then be discussed, including their potential global reach. Finally, a missing element pertaining to psychological factors in the prevention and mitigation of these risks will be revealed, delineating the importance of researching the topic – the focus of this thesis.

### **What Are Mass Gatherings?**

Mass gatherings are essentially large crowd events – the terms ‘crowd’ and ‘mass gathering’ tend to be used interchangeably in the literature (Zeitz et al., 2009). There is no universally agreed upon definition of what constitutes a mass gathering. Numerous definitions can be found in the literature, and these often specify the number of people required to be present to qualify as a mass gathering. This may be as few as 1000 individuals or exceeding 25000 individuals (Memish et al., 2012). However, these definitions are constrained by only taking into account a single characteristic of the crowd (the size) rather than a broader spectrum of characteristics (e.g., impact on health services; Arbon, 2007). The World Health Organization (World Health Organization (WHO), 2015) provides a clear healthcare-focused definition: “an organised or unplanned event can be classified as a mass gathering if the number of people attending is sufficient to strain the planning and response resources of the community, state or nation hosting the event” (p. 7). Irrespective of the definition, a mass gathering can be

demarcated as an event where a large number of people gather for a common purpose within a specific location for a defined period (Hutton et al., 2020; Memish et al., 2012). Examples of mass gatherings include sporting events, political rallies, religious festivals, and music festivals – such events often attract people globally.

To give an indication of the magnitude of some mass gatherings, the Kumbh Mela – a Hindu pilgrimage celebrated every three years in one of four cities in India – is the largest mass gathering in the world and attracted over 120 million pilgrims in 2013 (Cariappa et al., 2015; David & Roy, 2016). The gathering's sheer magnitude can best be depicted by the fact that, in 2001, the mass movement of people could be seen from space (Memish et al., 2012). Many pilgrims at the Mela live under rudimentary conditions on the banks of the holy rivers (Ganges, Godavari, Kshipra, and Sangam), drinking and bathing in the waters. While it is not obligatory for Hindus to participate in the Mela, it is obligatory for (financially and physically capable) Muslim pilgrims to converge in Mecca for the Hajj at least once during their life span to undertake a range of religious rituals (S. S. Khan et al., 2016). Considering there are nearly 2 billion Muslims worldwide, Hajj has become the largest annual mass gathering in the world with approximately 2 million pilgrims from over 184 countries attending in 2016 (Zumla et al., 2016). Part of the pilgrimage to Mecca involves circumambulation around the central shrine Ka'aba and upon successful completion of the Hajj as a whole, male pilgrims shave their heads as part of a religious ritual. Another pilgrimage of note is Lourdes (France), which attracts over 5 million Catholics (and others) every year. The Lourdes water, flowing from a spring, is believed to possess divine healing properties and thus many pilgrims, as part of the pilgrimage, drink and bathe in the water (Memish et al., 2012).

Turning to secular events, the month-long 2018 FIFA world cup hosted by Russia attracted 3 million people to watch 32 international teams participate in the event (Memish et al., 2019). Similarly, music festivals are massive industries that typically last three to four days and attract an audience ranging from 17000 to 175000 participants per day (Gautret & Steffen, 2016). The five-day-long Glastonbury Festival (United Kingdom; UK) is to date the largest greenfield festival in the world, having evolved from a ‘small’ gathering of 1500 people in 1970 to 177500 attendees in 2016 (Spotswood & Whitaker, 2017).

The magnitude of mass gathering events is striking and, not surprisingly, they are typically joyous and exciting events that elicit strong emotions among the attendees (Hopkins et al., 2016). On the other hand, mass gatherings can negatively affect health, and given their magnitude, when something goes astray, local healthcare services can be overwhelmed. The health risks associated with mass gatherings will be discussed in the following section.

### **Mass Gathering-Associated Health Risks**

On-site healthcare services are often provided within mass gatherings as they pose a range of serious health risks that are often dependent upon the type of event and present complex public health challenges (Anikeeva et al., 2018; Steffen et al., 2012). Non-communicable health risk examples include environmental stressors (e.g., noise and extreme weather conditions), human crushes as a result of over-crowding, and trauma incidences related to substance misuse (Memish et al., 2012; Steffen et al., 2012). For example, more than 18000 people at the 1985 Hajj and 2000 people at the 1996 Olympic Games (Atlanta, USA) were treated for heat-related illnesses – over 1000 of the Hajj pilgrims died (Steffen et al., 2012). Furthermore, a human crush at the Hajj in 2015 resulted in the death of over 2000 pilgrims (Salamati & Rahimi-Movaghar, 2016),

21 people were crushed to death during the 2010 music festival Love Parade in Germany, and 96 people died when crowds surged into the Hillsborough football stadium in the UK in 1989 (Memish et al., 2012). Although palpable, human crushes are not necessarily the only, nor most serious, concern in crowded places. On the contrary, the most severe health risk is the transmission of communicable diseases, expedited by the close physical proximity to masses of people and general lack of hygiene due to rudimentary facilities and living conditions (Abubakar et al., 2012; Barasheed et al., 2016; Ishola & Phin, 2011; Johansson et al., 2012; Kamran Khan et al., 2012; Tam et al., 2012). For example, numerous cholera epidemics as a consequence of drinking the extremely polluted Ganges water at the Mela have been reported (Memish et al., 2019; Sridhar et al., 2015) and the spread of sexually transmitted diseases is not uncommon within music festivals like Glastonbury (Abubakar et al., 2012). Moreover, several outbreaks of norovirus have been reported at the Lourdes pilgrimage (Gautret & Steffen, 2016). There is a further risk that diseases may spread beyond the bounds of the mass gathering when infected attendees return home, turning local outbreaks into pandemics (e.g., the worldwide spread of meningococcus in 2000/2001 facilitated via the Hajj; Abubakar et al., 2012; Tam et al., 2012).

Although health risks such as disease transmission and crushes can plausibly occur at any type of event, what health risks are most prevalent depends on the type of event - as previously mentioned. Escapism in the form of excessive alcohol and drug use within music festivals has been well documented and can lead to a range of health complications, including injury and unprotected sex (Hutton et al., 2013, 2018). Despite the documentation of the prevalence of alcohol and drug-related harm to music festival attendees, research studies within these environments are still relatively limited. This is

in part because of the driving commercial interests involved that are unsupportive of research being carried out within the festivals in attempt to prevent negative publicity – as an alternative, most UK-based studies have focused on the dance club scene (Martinus et al., 2010). Crowd members of outdoor music festivals are also exposed to the elements, often presenting with heat/cold-exposure complications and foot injuries from the muddy, uneven ground and long walking distances (Hutton et al., 2018). Moreover, noise levels can cause hearing loss and the ‘mosh pit culture’ at particularly heavy metal festivals, where crowd members intentionally crash into one another, can lead to head and crush injuries (Hutton et al., 2013). At sporting events, the animated mood (e.g., getting angry, jumping up and down or cheering together with higher levels of alcohol and (unhealthy) food consumption) among passionate spectators can trigger, for example, anxiety and heart attacks – it has also been associated with violence (Hutton et al., 2018, 2020).

On the opposite side of the spectrum, religious events are often defined by rituals that signal religious zeal. The risks religious rituals can pose are significant, such as injury, trauma or infection, and there is often pressure on the devotees to partake, disregarding health needs (Gatrad & Sheikh, 2005; Xygalatas et al., 2019). Performing the ‘side-roll’ at an annual Hindu festival in Sri Lanka involves soaking in the temple’s water tank and then side-roll on the sand (shipped from the coast) covered ground. This ritualistic behaviour has been shown to lead to increased incidents of cutaneous larva migrans – a skin infection (Pellerin & Edmond, 2013). Similarly, the ritualistic head shaving at the Hajj often involves communal use of razors or blades, carrying the risk of bloodborne disease transmission (e.g., HIV, Hepatitis B or Hepatitis C; Rashid & Shafi, 2006). Furthermore, bodily mutilation and prolonged suffering is an integral part of the ‘kavadi attam’ ritual performed by Tamil Hindus. Devotees pierce their bodies with various

metallic objects (e.g., rods impaled through the cheeks) and embark on a pilgrimage that lasts for several hours while carrying heavy altars. Some pilgrims may choose to wear shoes made of nails or drag sizable chariots by hooks attached to their skin (Xygalatas et al., 2019). Even death at a pilgrimage can be considered auspicious; dying during the Hajj is believed to have a favourable outcome in the afterlife, motivating some sick pilgrims to attend (Memish et al., 2012).

### **Mass Gathering Medicine**

The prospective potency of mass gathering-associated health risks has sparked multidisciplinary interest, and a multidisciplinary approach has accordingly been encouraged to address gaps in knowledge about the risks and their mitigation (Tam et al., 2012). Mass gathering medicine is a relatively new, rapidly evolving discipline that has arisen in response to the risks (Memish et al., 2019) but the field is theoretically underdeveloped – current evidence does not sufficiently inform the understanding of mass gatherings and associated health aspects (Steenkamp et al., 2016). However, it should be noted that the use of the term ‘mass gathering medicine’ is currently debated – a more encapsulating term has been suggested to reflect the underpinning multidisciplinary science: ‘mass gathering-health’ (Steenkamp et al., 2016). Although the term ‘mass gathering-health’ does appear to embrace the multidisciplinary nature of the discipline, the discipline will still be referred to as ‘mass gathering medicine’ in this thesis for clarity as a new term has not yet been agreed upon.

There are very few models to facilitate understanding of patient presentation rates (i.e., patients presenting to healthcare services per 1000 attendees), potential drivers for injuries and illnesses, and consequent resource and response requirements from healthcare services at mass gathering events (Arbon et al., 2001; WHO, 2015). To this end, Arbon (2004) proposed a conceptual model based on the assumption that health

effects of mass gatherings can be understood as an inter-relationship between three key domains: the environmental, the biomedical, and the psychosocial. Each domain is characterised by key features that influence the rate of injury and illness, and these key features combine to produce an effect on event attendees' health. The environmental domain concerns the environmental features of a mass gathering, such as weather conditions, terrain, crowd size, and venue type (Arbon, 2004). For example, the patient presentation rates at outdoor events are typically higher than at indoor events, and patients often present with environmentally associated injuries or illnesses like lacerations and heat-related illnesses (Locoh-Donou et al., 2016; WHO, 2015). The biomedical domain is focused upon biomedical influences on patient presentations, such as crowd demographics and the health status of attendees (Arbon, 2004). For example, electronic dance music festivals often attract younger crowds and have been associated with higher levels of drug and alcohol-related presentations – presumably because this demographic may lack awareness of the dangers linked to consumption of these substances (FitzGibbon et al., 2017; Locoh-Donou et al., 2016). Moreover, women and children are seemingly more vulnerable during crowd emergencies, and the elderly are more susceptible to heat (Steffen et al., 2012). The psychosocial domain involves the psychological and social influences in mass gatherings, including crowd mood and behaviour, crowd culture, and motivations for attendance (Arbon, 2004; Ransie & Hutton, 2012). For example, music festival attendance may be motivated by a desire to escape everyday life, and the use of alcohol and drugs may be integral to this end. Furthermore, the animated mood and rivalry at sports events or demonstrations may lead to violence (Hutton et al., 2013, 2018, 2020; Steffen et al., 2012).

While environmental and biomedical factors have been focused upon, the psychosocial domain has been neglected as a potential driving factor in negative health outcomes in



mass gatherings (Hopkins & Reicher, 2016a, 2016b, 2017; Hutton et al., 2020; Zeitz et al., 2009). Strategies for preparedness and prevention have revolved around physical factors and thereby physical means to mitigate health risks – particularly in relation to communicable diseases (Hutton et al., 2018). For example, environmentally related preventative strategies include, among others, crowd traffic control at bottlenecks, provision of shaded areas and free water, and climate control at indoor events (Locoh-Donou et al., 2016; Steffen et al., 2012). Biomedically-related mitigation measures revolve around the provision of on-site healthcare, advice (e.g., cardiology advice for stress control), and equipment, such as automated defibrillators (Steffen et al., 2012). Similarly, to mitigate communicable health risks, vaccinations and the use of condoms and face masks have been promoted (Abubakar et al., 2012; Memish et al., 2012; Shafi et al., 2016; Steffen et al., 2012). The WHO (2015) has recognised the neglect of the importance psychosocial factors may play in the aggravation and mitigation of mass gathering-associated health risks and has therefore issued a call for action:

“There is a need to understand audience behaviour to support its appropriate and timely management during an event. Management of planned events therefore needs to consider psychosocial elements in the planning and monitoring of events to ensure public safety...Psychosocial elements and audience behaviour should be given equal priority in the development of the [mass gathering] body of knowledge.” (p.149)

As aforementioned, and in concurrence with the WHO (2015), the field of mass gathering medicine is theoretically underdeveloped and is, in particular, largely missing a psychological element (Steenkamp et al., 2016). Hopkins and Reicher (2016a, 2016b, 2017) have argued that mass gathering medicine research should not simply view mass gatherings as clusters of large numbers of different people; it needs to consider the

psychological transformations that occur when people become part of a crowd and how these changes implicate health-related behaviours, perceptions, and outcomes. To this end, the social identity approach (Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) provides a theoretical framework for understanding how psychological processes underpin health risk perceptions and behaviours in small group and mass gathering settings alike. This framework will be described in Chapter 2, together with an account of how it is entrenched in health-related perceptions and behaviours.

## CHAPTER 2: Theory and Literature Review

### Chapter Overview

The previous chapter identified that mass gathering medicine is lacking a psychosocial element and theoretical framework to understand and explain crowd behaviour and related health outcomes. To this end, this chapter describes the theoretical framework underpinning this thesis – the social identity approach (Tajfel & Turner, 1979; Turner et al., 1987). The social identity theory and self-categorisation theory are first presented, together with definitions of key terms and processes, followed by classical and contemporary theories of crowd psychology, including the social identity model of crowd behaviour. The social identity approach to health in small and large group settings is then outlined. Finally, drawing on presented research and theory, the potential deleterious implications of social identity processes for health outcomes in mass gatherings are considered, highlighting the research gap to be explored in this thesis.

### The Social Identity Approach

The social identity approach (or perspective) is a theoretical framework to group processes that comprises two theories: *social identity theory* (SIT; Tajfel & Turner, 1979) and its extension, *self-categorisation theory* (SCT; Turner et al., 1987). SIT was originally developed to explain group behaviour in relation to intergroup conflict as the significance of identification with the ingroup had been neglected by the then-dominant ‘realistic group conflict theory’ (Tajfel & Turner, 1979). The theory now, conjointly with SCT, serves to explain group processes, intergroup relations, and self-concept at large (Hogg & Reid, 2006). Furthermore, the approach has, for example, been applied to examine and explain processes and outcomes in organisational, health, clinical, and policing contexts (S. A. Haslam, 2014; Stott et al., 2020).

SIT conceptualises self-concept as a cognitive structure involving two subsystems: personal identity and social identity. Personal identity refers to the unique characteristics of an individual and defines how one individual is unique compared to others. In contrast, social identity denotes an individual's sense of self derived from memberships in social groups and categories and defines how members of a category are unique compared to members of a different category (e.g., Christian versus Muslim or Manchester United supporter versus Liverpool supporter; Reicher, 2001; Tajfel & Turner, 1986). This is the core tenet of the theory, with social identity originally defined as: "the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership" (Tajfel, 1972, p. 31). Put differently, social identity concerns internalised group membership that defines people's sense of self in a given social context. Tajfel and Turner (1979, 1986) proposed that in the pursuance of understanding behaviour in diverse social contexts, it has to be recognised that individuals can derive their sense of self from not only personal terms ('I' or 'me'), but also social terms ('us' and 'we'). Moreover, belonging to a social group, thus deriving a self-concept from the salient group membership, typically motivates people to endeavour to uphold a positive sense of self. This can be achieved by positively distinguishing their social group (the ingroup) from other groups with which they do not identify (i.e., groups they do not belong to – outgroups). People therefore – behaviourally and perceptually – seek to favour the ingroup over the outgroup (Terry et al., 1999).

SCT is an extension and development of SIT and focuses on social cognitive processes that lead individuals to identify with social groups, view themselves in group terms, and adapt group behaviours (Hogg & Reid, 2006). In contrast to SIT, SCT focuses primarily on intragroup processes rather than intergroup processes (S. A. Haslam, 2004). The

theory suggests that ‘self-categorisations’ are cognitive representations of the self and that people can define themselves at multiple levels, ranging from personal self-categorisation to shared, collective self-categorisation. These categorisations vary in salience depending on the social context and each, in turn, have implications for the individuals’ behaviour and perception (Turner et al., 1987, 1994). For categorisations to lead an individual to behave according to group norms, the individual has to psychologically identify with a particular ingroup in that particular context. That is, the categorisation must be psychologically salient (Hogg & Reid, 2006). Hogg and Reid (2006) define group norms as “regularities in attitudes and behaviour that characterize a social group and differentiate it from other social groups” (p. 7). Put differently, group norms shape how a given social identity is expressed – they are the values and rules of conduct linked to a given social identity. Norms are therefore shared patterns of cognition, affect, and behaviour, and how people act in groups communicates norm information. People may indirectly infer norms from what they see others say and do or directly as people may intentionally, through speech or non-verbal cues, convey what is or what is not normative of the group (Hogg & Tindale, 2005).

Social identity salience is governed by accessibility and fit. People draw on readily available categories (i.e., social categories that are used frequently and considered important – thus easily accessible within the cognitive system) to interpret social contexts. They consider how well the categorisation explains similarities and differences among other individuals (termed ‘comparative fit’) and how well normative expectations of the categorisation explain why others engage in certain behaviours (termed ‘normative fit’). A poor categorisation fit will lead people to consider other accessible categorisations until a better matched categorisation is obtained – this ‘best fit’ social categorisation becomes psychologically salient in that context and guides

perception and behaviour (Hogg & Reid, 2006). Turner et al. (1987) suggested that the greater the extent to which people self-categorise in terms of a specific group membership in a specific instance, the more likely they are to view themselves as categorically interchangeable with other group members. Consequently, they will be more receptive to the group norms and more likely to act in accordance with the norms – the greater the social identification with the group, the greater the receptivity and conformity to the norms (Hogg & Reid, 2006). People do this as they strive to reach agreement with their fellow ingroup members because the group defines their sense of self. Hence, they wish to maintain a positive and distinct image for the group and by doing so they positively enhance their sense of self (Turner, 1991).

Overall, the social identity approach is well established, with thousands of empirical studies affirming that self-definition derived from group memberships affects thoughts, perceptions, attitudes, and behaviour (S. A. Haslam, 2014; for more extensive reviews of the theoretical framework, e.g., see Hogg & Reid, 2006; Hornsey, 2008) – including in crowd settings. What follows is an overview of crowd psychology, including the social identity approach to crowd behaviour.

### **Crowd Psychology: From Classical to Contemporary Theory**

Before reviewing the social identity approach to crowd behaviour – the cornerstone of this thesis – it is important to very briefly consider the history of crowd psychology to gain a better understanding and appreciation of the discipline (e.g., see McPhail, 1989; Reicher, 2001, 2012; Stott & Drury, 2017 for detailed reviews). Although many philosophers and scholars (e.g., Aristotle, Plato, Herodotus, and Luther) have remarked on the nature of crowds, it was not until the end of the 19<sup>th</sup> century that theories of crowd psyche began to develop (Carey, 1992; Reicher, 2012). These theories and related research on crowd behaviour have conventionally focused on violence (Drury,

2020) and it is in this tradition that Gustav Le Bon is widely referred to in terms of classical crowd psychology (Reicher et al., 2004; Zeitz et al., 2009). Le Bon (1895/1947) claimed that when people become part of a crowd, they become anonymous and lose their sense of personal identity – a process termed ‘submergence’. As a consequence, people lose control over their feelings and actions and can no longer tell the difference between appropriate and inappropriate behaviour because of the loss of personal values. All that remains are the passions and the sentiment of invincible power wherein crowd members become subject to passing ideas and emotions in the crowd – termed ‘contagion’. The combination of submergence and contagion results in crowd members’ loss of civilised standards and, in turn, generates primitive behaviour (Reicher, 2012). Crowds are essentially about loss of identity, socialisation, rationality, and morality according to Le Bon (Reicher, 2017). Illustratively, Le Bon (1895/1947) described the crowd member as: “a barbarian – that is a creature acting by instinct. He possesses the spontaneity, the violence, the ferocity, and also the enthusiasm and heroism of primitive beings” (p. 32).

Although Le Bon’s theory of crowd behaviour is still influential to date, it has been criticised through the years and is contested by more contemporary models (Reicher, 2012; Reicher et al., 2004; Stott & Drury, 2017). The first to dispute Le Bon’s theory was Allport (1924) and the ‘convergence’ approach to crowd action which emerged from his work. The theory proposes that collective action can be attributed to individual predispositions and that violence is engendered from anti-social personalities (Reicher, 2012). This theory was, in turn, questioned by the ‘emergent norm theory’ which rejects the view of crowds as pathological. The tenet of this theory is that collective action transpires under the governance of emergent norms that set limits on what is appropriate (Turner & Killian, 1987). However, the theory has been criticised for being

unable to explain how crowd unity can be achieved in a short period. Overall, the most prominent issue with these three theories of crowd behaviour is that they divorce crowd action from the social context in which it occurs (Reicher, 2012). No consideration is given to the motivating forces that lead crowds to gather (e.g., social injustice) and the processes involved in intergroup conflict (e.g., protestors versus the police). The crowd is seen as the sole source of violent action and transformations in collective behaviour is seemingly random and volatile (Reicher, 2001).

Turning to the social identity approach, it is not until relatively recently it has become the transcending psychological approach to crowd behaviour and group processes at large (Reicher, 2012). The social identity model of crowd behaviour (SIM; e.g., see Reicher, 1984) challenges the classic models of crowd behaviour that decontextualise and depict crowds as sites of irrationality and deindividuation as a result of a loss of identity (Reicher, 2012). By contrast, research grounded in this theoretical framework has shown that people's behaviour in crowds is not random or meaningless. SIM posits that crowd members do not lose values and standards – and hence their identity – but rather shift from their personal identity to a social identity. This shift motivates crowd members to act in accordance with the norms associated with the relevant social category and crowd behaviour will therefore vary as a function of what type of category is involved (Reicher et al., 2004). Naturally, then, the norms of a crowd of, for example, heavy metal music festival attendees will be greatly different from those of a crowd of Catholic pilgrims. Moreover, as people can identify with more than one social category, their values and behaviour will vary depending on which group membership is salient in any given social context (Reicher et al., 2004). To illustrate, a doctor watching a band play at a music festival may embody norms of frivolity, cheering and consuming more alcohol than they would in another social context. However, if someone were to



collapse in the crowd, the doctor – with the intention to help – would likely shift from their ‘festival-goer identity’ to their ‘doctor identity’, embodying the associated values and norms of healthcare professionals. SIM therefore demonstrates the malleability of the social self and how cognitions and actions are shaped by the social self that is salient in any given context (Reicher, 2017).

SIM makes a key distinction between physical and psychological crowds. People in physical crowds are simply co-present in the same location by chance and retain a strong sense of personal identity (‘I/me’; e.g., travellers in a busy airport). By contrast, people in psychological crowds feel and act ‘as one’ and perceive a shared social identity (e.g., ‘we/us festival-goers’) (Hopkins & Reicher, 2016a, 2016b; Reicher, 2012; Reicher et al., 2007). A crowd may therefore comprise no psychological groups (crowd members do not have a sense of shared social identity), a single psychological group (crowd members have a sense of shared social identity) or multiple different psychological groups (e.g., rival fans at a football match) (Reicher et al., 2007). As such, the mere co-presence of a large number of individuals does not automatically constitute a psychological crowd – this is only the case when there is a sense of a shared social identity (i.e., when crowd members view themselves and others as belonging to a common social category and share a purpose and meaning for being in the crowd) (Reicher, 2012). Furthermore, individuals in the same crowd may experience different degrees of a shared identity with other crowd members, and a shared identity may be more readily attained at some crowd events than others (Hopkins & Reicher, 2017; Neville & Reicher, 2011).

According to SIM, becoming part of a psychological crowd and viewing other crowd members as part of a collective entails three psychological transformations: cognitive, relational, and affective (Reicher, 2012). In relation to the cognitive transformation, the

shared social identity in psychological crowds stipulates what is and what is not normative conduct and crowd members conform accordingly. More specifically, personal norms and values are replaced by those which define the social category in question (Hogg & Reid, 2006; Tajfel & Turner, 1979). Crowd behaviour will therefore vary depending on involved categories (Reicher, 2012). The relevant social identity sets clear limits to acceptable behaviour – actions which are salient with the identity of the crowd generalise, whereas non-salient actions are ignored or stopped. For example, Reicher (1984) studied the 1980 St. Pauls' riots in Bristol (UK) and noted how behaviour did or did not generalise within the crowd. When someone from the crowd attacked the police, others joined in because the police were viewed as an illegitimate presence – the behaviour became normative. However, when someone damaged a bus or windows of local shops, the behaviour did not generalise and become normative – other crowd members actively intervened to prevent it because of the illegitimacy of the target in relation to the crowd identity.

The relational transformation that occurs revolves around the relationship shift between crowd members; they shift from being 'other' to being part of a collective self as they are aware of sharing a social identity with others in the crowd (Reicher, 2012). Sharing a social identity with others has cognitive, behavioural, and affective consequences, such as increased trust, helping behaviour, and cooperation (Jetten et al., 2012; Reicher, 2011). As such, there is an expectation that fellow crowd members will share similar norms, values, and beliefs. Consequently, there will be mutual trust and support within the crowd. Additionally, people within the crowd will feel united and empowered, and 'self-interest' is transformed into 'our-interest' (Reicher, 2012). For example, people have been shown to frequently expose themselves to risk by attempting to aid and

support their fellow crowd members when they are under attack or being arrested by the police (Stott & Drury, 2000).

The affective transformation concerns the highly passionate and emotional experiences in crowds (Reicher, 2012). It contrasts that of Le Bon's view on crowds in which passion in the crowd is derived from the loss of identity and mind. Instead, passion flows from the fact that crowd members are able to enact their shared social identity and its associated norms and values (Drury et al., 2005; Drury & Reicher, 2005; Hopkins et al., 2016; Pehrson et al., 2014). These and other social identity processes will be discussed in more detail further on in this chapter.

SIM has given rise to several models of crowd behaviour, one of which is the 'Elaborated Social Identity Model' (ESIM; e.g., see Drury & Reicher, 2000; Reicher, 2012; Stott et al., 2001; Stott & Drury, 2017). ESIM was developed as an extension of SIM to place greater emphasis on intergroup context – it examines how social identities within groups can change as a result of intergroup dynamics (Drury & Reicher, 2000). A pattern was observed in crowd behaviour across numerous studies of crowd events where non-violent crowd members became violent. This violence was engendered because of the indiscriminate heavy-handed actions by the police towards the crowd as a whole rather than targeting misbehaving individuals (Reicher, 1996; Reicher et al., 2004, 2007; Stott et al., 2001; Stott & Drury, 2000). More specifically, 'peaceful' crowd members (ingroup) perceived the indiscriminate violent intervention (in response to a minority of violent crowd members' behaviour) by the police (outgroup) as illegitimate in ingroup terms and therefore redefined their social identity and came to see violent behaviour towards the outgroup as legitimate (Stott, Drury, et al., 2012). In other words, the illegitimate treatment by the police led to a sense of common fate and, in turn, a shared identity among previously separate and pacific groups in the crowd,

motivating collective action against the police (Reicher, 2017). The ESIM provides a deeper understanding of crowd action and violence and has been applied to public order policing to prevent and de-escalate collective conflict (e.g., Reicher et al., 2004, 2007; Stott et al., 2020). This concludes the overview of the social identity approach to crowd behaviour. The next section will consider why and how the social identity approach has been applied within health contexts.

### **The Social Identity Approach to Health**

Research within the fields of sociology, epidemiology, politics, and economy has provided evidence for how factors such as social status, poverty, and inequality can predict health, urging policymakers to consider the social aspects of health (Jetten et al., 2017). Relatedly, social psychologists have relatively recently started to investigate how identifying with others as part of a common collective can protect and promote health. There is a burgeoning body of evidence for the positive impact of various forms of social connectedness (e.g., interpersonal relationships, social networks, and social identities) on both physical and mental health (S. A. Haslam et al., 2009; Jetten et al., 2012, 2014, 2017). Pioneering research in the form of a review of five large studies investigating the link between social relationships and mortality was presented over three decades ago by J. S. House et al. (1988). The authors concluded that social relationships predict mortality, which sparked a flurry of health-related research that included measures of social relationships. A more recent meta-analysis by Holt-Lunstad et al. (2010) was conducted to primarily determine the magnitude of the effect of social relationships on mortality and included 148 studies. The results indicated a 50% increase in odds of survival for people with adequate social relationships compared to those with poor social relationships. Adequate social relationships were considered to encompass higher levels of integration in social networks, supportive

social interactions, and perceived availability of social support. This effect, even when controlling for demographic factors known to implicate health (e.g., age, gender, and initial health status), is equivalent to, or surpasses, many recognised risk factors for mortality, including quitting smoking and physical inactivity. Similar findings were obtained in another meta-analysis which suggested that there is a strong positive correlation between social capital and health (Gilbert et al., 2013). Social connectedness has also been shown to play an important role in, for example, overcoming drug or alcohol dependence and preventing engagement in these behaviours through the buffering effects of healthy and socially supportive peer relationships (e.g., Best et al., 2012; B. T. Johnson et al., 2010). Together, these studies demonstrate the important role social connectedness plays in relation to health.

As a large body of research has demonstrated the significant effects of social connectedness on health, it has recently become more pertinent for researchers to attempt to better understand and explain *how*, *why*, and *when* such effects occur. In other words, it is of interest to develop a comprehensive theoretical framework by unearthing the processes underlying the relationship between social connectedness and health (C. Haslam et al., 2018; Jetten et al., 2012, 2014). It is here an issue with the social connectedness and health literature becomes apparent. Social connectedness as a psychological construct has been conceptualised, theorised, and operationalised in a multitude of ways in the literature concerning its effects emanating from group membership, social support, and social networks on health (Jetten et al., 2014). Examples of common conceptualisations within the literature – which tend to be used interchangeably despite being rooted in different theories and are measured using different instruments – include social networks, social capital, interpersonal relationships, social roles, and friendships (Jetten et al., 2012). For example, some

researchers focus on the construct of loneliness, whereas others focus on social support and contact frequency in social relationships. Others may only consider features of the social networks (e.g., size) or perceptions of available social capital.

*How* and *why* questions (i.e., how and why social connectedness leads to positive versus negative health outcomes) are therefore addressed and answered differently depending on the researchers. For example, researchers who stress the importance of social support propose that it is the concrete and tangible benefits that social connectedness produces that explain the positive effects upon health. By contrast, researchers who focus on loneliness propose that it is the lack of social networks that produces negative effects upon health (e.g., see Cacioppo & Patrick, 2008; Jetten et al., 2014). Answering *when* questions (i.e., when social connectedness leads to positive versus negative health outcomes) also becomes difficult when researchers fail to examine the quality of social relationships, and if, and to what degree, they are perceived as positive or negative. It hinders a distinction from being made between people whose negative health outcomes are the result of lacking social connections or of having multiple but dysfunctional social connections. As such, the emphasis on different processes and aspects of social connectedness that implicate health can result in mixed or contradictory findings and conclusions. Furthermore, methodological weaknesses are also common within the social connectedness and health literature (Jetten et al., 2014). For example, many studies in the social connectedness and health literature are correlational, precluding claims of causation (i.e., that it is changes in social connectedness that cause changes in health, be it improvement or decline). There is simply a lack of both experimental and longitudinal research (Cohen & Janicki-Deverts, 2009).

Taken together, the disparity in conceptualising, theorising, and operationalising social connectedness, and the methodological limitations, have ultimately acted as a barrier to

developing a comprehensive theoretical framework to answer *how*, *why*, and *when* questions across different social contexts and social connections (Jetten et al., 2012, 2014). To this end, many researchers have relatively recently adopted the social identity approach as a theoretical framework to investigate how social identities and factors linked to them (e.g., social support and cooperation) may generate a 'social cure', or inversely, a 'social curse' (Jetten et al., 2012). On the one hand, the *social cure* is referred to when social group memberships and psychological identification with groups bring about health benefits. On the other hand, the *social curse* paradigm refers to the phenomenon where the psychology of a social group is turned against the group member(s); rather than the group improving health or acting as a buffer against negative factors, it undermines health (C. Haslam et al., 2018; Jetten et al., 2012). The social identity framework offers a range of tenets that allows for theorisation and empirical examination of the factors and processes (e.g., group norms and social support) that underpin the relationship between social connectedness and health, rather than simply asserting that a relationship exists (Jetten et al., 2014).

Although the social identity approach has typically been used to understand issues of intergroup relations, it may aid in the understanding of why, for example, people sometimes engage in health-promoting behaviours and other times health risk behaviours (S. A. Haslam et al., 2009; Hopkins & Reicher, 2017; Jetten et al., 2017). This can be achieved by considering how people understand and respond to social structural conditions they are surrounded by, and focusing on social psychological dynamics of self-conception (S. A. Haslam et al., 2009). When an individual's social identity is salient, they emphasise their similarities with other group members, feel socially connected to them, are influenced by them, are motivated to promote the welfare of the group, and act in accordance with group norms – they derive their sense

of self from the salient identity and group members become part of the self (Tajfel & Turner, 1979; Turner et al., 1987). Hence, to better comprehend and explain the relationship between social connectedness and health, social identification ought to be a focal point. Applying this theoretical framework allows a more uniform conceptualisation of social connectedness – the degree to which social relations with others and social groups or categories are subjectively viewed as both shared and self-defining. If people perceive a social relationship as self-defining, this social connectedness may arguably be able to predict health-related outcomes (Jetten et al., 2012, 2014).

The premise of the social identity approach to health is that it targets both social and psychological dimensions of health, bridging existing social, psychological, and biomedical approaches; it conjunctively emphasises the importance of social groups for health and psychological identification with those groups (C. Haslam et al., 2018). Social identification has indeed been shown to exhibit vast cognitive and behavioural consequences - some of which have implications for health (Greenaway et al., 2015). Likewise, research has shown that it is people's subjective identification with social groups, rather than objective contact frequency with them, that is associated with positive (or negative) health outcomes (Jetten et al., 2012; Wakefield et al., 2016). That is not to say that all groups to which people belong and identify with affect their health. When people do not highly identify with a group, the group membership is not perceived as an important part of the self and will therefore have limited, if any, impact on their health. That is, group members experience the health effects of group membership only to the extent that they identify with the group (Cruwys et al., 2014; Jetten et al., 2017; Steffens et al., 2017; Turner et al., 1987).



The next sections of this chapter will focus on how social identification, and associated cognitive and relational transformations, can be a basis for health improvement or health decline. Examples of these will be considered – the list is not exhaustive but provides a good indication of the implications, building a foundation for the theorisations of the social cure in mass gatherings. To this end, literature situated in both mass gathering and small group settings will be drawn upon. It should be noted that while the social cure paradigm is becoming progressively well defined, the social cure paradigm is currently less understood and limited to a smaller body of literature (Wakefield et al., 2019). Furthermore, a more elaborate account of the health-impairing influences of social identity processes is provided in Chapter 4 and 6, involving a systematic review and a systematic scoping review of the literature, respectively.

### ***General Health and Wellbeing***

Before delving into and focusing upon social identity *processes*, it seems appropriate to first provide an overview of general social identity-related health and wellbeing *outcomes*. The wide range of general health and wellbeing benefits of social identification in small – typically enduring (e.g., organisational) – group settings have been well-documented (e.g., see C. Haslam et al., 2018; Jetten et al., 2012; Wakefield et al., 2019 for a comprehensive overview). For example, social identification has been shown to exert a positive influence on physical and mental health, sleep, stress, depression, addiction, and eating behaviour. The basis of this positive relationship pertains to, among others, the social support, a sense of belonging and purpose, agentic control, self-esteem, and self-efficacy emanating from group membership (e.g., Cruwys et al., 2014; Dingle et al., 2015; Du et al., 2017; Greenaway et al., 2015, 2016; Jetten et al., 2017; McNamara & Parsons, 2016; K. Miller et al., 2016; Steffens et al., 2016, 2019; Wakefield et al., 2020).

General health and wellbeing benefits can also derive from social identification with a large-scale group, including from national identification (S. S. Khan et al., 2020). Furthermore, social identification in mass gatherings, despite their associated risks and transient nature, has been associated with positive health outcomes. Pilgrims at the Magh Mela reported a longitudinal increase in self-assessed health relative to control participants who did not attend the pilgrimage (Tewari et al., 2012). A complementary study revealed that the psychosocial mechanism underlying this effect pertained to ‘relationality’ and a sense of shared social identity; a shared identity among the pilgrims was positively correlated with self-assessed health, and this was mediated by relationality. Put differently, the more the pilgrims experienced a sense of shared identity with other pilgrims, the more they experienced their social relations with other pilgrims to be respectful, understanding, and supportive (S. S. Khan et al., 2015). Subjective health can thus be enhanced to the extent that people perceive a shared identity and social relations with other crowd members to be more intimate and supportive. Similar findings have been reported in relation to mental health benefits of mass gathering attendance; identification with other attendees at a youth mass gathering in Australia predicted improved mental health, and this relationship was strengthened over the course of the event (Cruwys et al., 2019).

Although there is cumulative evidence that social identification with social groups can protect (e.g., it can act as a buffer against the negative health effects of stressors, such as group-based discrimination; S. A. Haslam et al., 2005; Jetten et al., 2017) and enhance health and wellbeing, through a sense of belonging and connectedness, there are also contexts where social identification can be detrimental for health (Greenaway et al., 2016). Group memberships can make people feel unworthy, incapable, and unsupported (Wakefield et al., 2019). For example, where membership of a group is

undermined (i.e., where some group members are actively excluded from the group for having breached the group's norms and values), social support from fellow group members is withheld and this, in turn, has a detrimental impact on health and wellbeing (Kellezi & Reicher, 2012). Moreover, belonging to disadvantaged or stigmatised groups can have serious negative implications for mental and physical health as, for example, group members may experience discrimination in terms of education, housing, and the legal system. In these cases, group membership may constitute a stressor – particularly if little support exists within the group (C. Haslam et al., 2018; Jetten et al., 2012).

### ***Social Support, Trust, and Cooperation***

There are several definitions of what social support encompasses but to give an indication, J. S. House (1988) proposed four aspects: emotional support (empathy, acceptance, and self-worth), companionship (others are there to help), instrumental support (practical aid), and informational support (advice). A body of research has shown how social identification with groups can induce an enhanced sense of social support from other group members, promoting a greater sense of ability to be able to cope with hardships (S. A. Haslam et al., 2005; Jetten et al., 2012). For example, participants who experienced laboratory-induced pain displayed significantly lower levels of physical arousal when they received reassurance from an ingroup member compared to when reassurance originated from an outgroup member (Platow et al., 2007). Similar findings have been reported in mass gathering settings in terms of coping with noise and cold temperatures. Continuous and cacophonous noise is inherent to the Magh Mela, yet pilgrims do not experience the noise as negative, but rather as positive and serene (Shankar et al., 2013). The authors of the research argue that this is because participation in the Magh Mela is central to the pilgrims' self-definition. Hence, anything that represents the event is viewed positively by them – particularly if it is

perceived to facilitate the enactment of the pilgrim identity. Similarly, enduring cold temperatures at the Magh Mela is seen as identity-affirming. Observing others cope with the cold can be inspiring, and pilgrims may, in fact, directly persuade others that they too can cope. Moreover, pilgrims both provide and expect practical support from others in dealing with the cold, including in terms of resource sharing (e.g., blankets), or any other difficulties that may arise (Pandey et al., 2014).

In a similar vein, studies have shown that social identification can increase helping behaviours in adverse situations. However, whether a person will help depends on if the person in need of help is categorised as an ingroup or outgroup member (Drury et al., 2009a, 2009b; Drury et al., 2009). To illustrate, Levine et al. (2005) demonstrated how an injured stranger wearing an ingroup t-shirt (football team) was more likely to receive help from bystanders than when wearing an outgroup (rival football team) or control (unbranded) t-shirt. The level of help offered was therefore dependent on the extent to which the injured individual and the bystanders shared a salient social identity.

Relatedly, people are more likely to accept help from an ingroup member (S. A. Haslam et al., 2009). The positive influence of a shared social identity on helping behaviours is not isolated to an individual or smaller group scenarios – it has also been demonstrated in large-scale scenarios, including mass emergencies and disasters (e.g., see Drury, 2018 for an overview). For instance, Drury et al. (2009) conducted a virtual reality paradigm in which participants' task was to escape from a fire in a busy underground station. A few crowd members in the simulation were injured and required help to escape. If participants chose to stop and help them, their 'danger of death' score and exit time increased. Participants who highly identified with the crowd were more helpful – i.e., there was a strong positive correlation between crowd identification and helping behaviour.

Similar to Drury et al.'s (2009) findings, social support has also been reported in 'real-life' events, including sudden-impact events like the 2010 Chile earthquake and 2005 London bombings, and rising-tide events like the 2015 York floods (Drury et al., 2009a; Drury et al., 2016; Ntontis et al., 2018). Moreover, a near disaster occurred at an outdoor music event (Brighton beach) in 2002 where 250,000 rather than the expected 65,000 people flooded the beach, blocking the emergency exits as the tide started to rise. Despite this, social identification with other crowd members predicted feeling safe, directly and indirectly, via expectations of help and trust in other crowd members to handle an emergency (Drury et al., 2015). The social identity literature surrounding mass emergencies and disasters has given rise to a social identity model of collective behaviour in mass emergencies and disasters. In short, the model posits that the emergence of a shared social identity among survivors encourages mutual support; the basis of this shared social identity is the common fate shared by the people in the emergency event (Drury, 2012).

Turning to trust, this is a construct that involves relinquishing, to an extent, control or power over outcomes valuable to the self (Tanis & Postmes, 2005). A shared social identity has been shown to impact perceptions of trustworthiness and elicit experiences of increased trust among ingroup members. For example, shared group membership was a strong predictor of trusting behaviour in Tanis and Postmes' (2005) experimental paradigm involving an investment game. Additionally, a shared social identity can influence trust via increased source credibility (Ross et al., 2014). More specifically, residents in a drought-stricken area in Australia who had been asked to consider a new recycled water scheme completed questionnaires examining the relationship between trust, risk, and acceptance of the proposed scheme, as well as potential factors that impact trust. The more the residents perceived the water authority as using fair

procedures, the greater their sense of a shared social identity with the authority. This sense of shared social identity, in turn, influenced trust; the greater the sense of shared social identity with the authority, the more credible the authority was perceived to be and subsequently the more they could be trusted.

The tendency to trust ingroup members has been suggested to increase odds of survival; people typically interact more with ingroup members than outgroup members and therefore have greater experience of successfully working and coordinating within groups. This renders ingroup members particularly attractive interaction partners whom people expect to act in a prosocial manner (Cruwys, Greenaway, et al., 2020). Indeed, sharing a social identity with others has also been shown to increase cooperation with ingroup members (Tyler & Blader, 2000). The ‘group engagement model’ offers an explanation for this. The model suggests that people’s level of cooperation with groups depends on the extent to which they identify with the groups; people who highly identify with a group wish to maintain a favourable social identity and see the group as a whole succeed – this, in turn, motivates cooperation (Tyler & Blader, 2003). An example of increased cooperation as a consequence of social identity can be seen in a series of experiments in which participants played social dilemma games involving shared resources – cooperation increased when a social group identity was made salient (Brewer & Kramer, 1986; Kramer & Brewer, 1984).

### ***Health-related Norms***

Social identity and consequent group norms have been shown to affect people’s health-related intentions and behaviours – for better or for worse (C. Haslam et al., 2018; Jetten et al., 2012). According to the social identity approach, when people define themselves based on a specific social group membership they internalise and conform to the group norms to express or affirm their identity (Tajfel & Turner, 1979). This has

been exemplified in two studies by Terry and Hogg (1996) in which perceived norms of a salient social group were shown to positively influence intentions to engage in regular exercise and sun-protective behaviour, but only among high identifiers. Moreover, it has been shown that participants who believed that the group norm advocated engaging in household recycling were subsequently more likely to report having performed the behaviour compared to participants who did not share this perception of the group norm (Terry et al., 1999). Similar findings have also been reported concerning, for example, healthy eating intentions and behaviour whereby group norms predicted the former (Louis et al., 2007; Stok et al., 2014). As such, people's health attitudes, intentions, and behaviours are influenced by their sense of self in terms of their social identities (Jetten et al., 2012). The extent to which people's health behaviours and subsequent health outcomes are influenced by others depends on the extent to which they are perceived to share a social identity (Jetten et al., 2014).

While some social groups encourage engaging in healthy behaviours, other social groups can, through the same processes, promote unhealthy behaviours. Health risk behaviours such as smoking, binge drinking, engaging in unprotected sex, and use of recreational drugs have been linked to group norms associated with social identities that become salient for people in certain contexts (S. A. Haslam et al., 2009; Livingstone et al., 2011; Tarrant & Butler, 2011). For example, Oyserman et al. (2007) examined how the social identities of ethnic minority and majority (White middle-class) participants influenced their beliefs about ingroup goals and strategies. The minority participants viewed healthy behaviours (e.g., exercising and eating fruits and vegetables) as White middle-class (outgroup) behaviour and this behaviour was therefore not salient with their identity – i.e., they viewed it as non-normative for their group. By contrast, they perceived unhealthy behaviours (e.g., smoking and adding salt to food) as part of their

ingroup identity and displayed less desire and intent to engage in a healthy lifestyle, and expressed more fatalism about their health. This negative relation to health was heightened when the salience of their social identity was strengthened through priming. Hence, when individuals perceive a behaviour as salient with their social identity, they are motivated to endorse that behaviour because it is identity affirming regardless if it is detrimental to their health.

How and why people come to identify with groups associated with unhealthy norms has also been investigated. For example, a pathway into drug addiction is that of a gain of identity. More specifically, experiencing social isolation together with unmet identity needs can draw people – who are consequently susceptible to normative peer influence – to the ‘user’ identity because it promises social group membership, social support, and self-esteem (Dingle et al., 2015).

### ***Positive Affect, Empowerment, and Collective Self-Realisation in Crowds***

Intensely positive emotional experiences are often associated with mass gatherings (Hopkins et al., 2016). It is not until recently social identity-based research has begun to investigate these positive experiences and pinpoint what mechanisms underlie them. Hopkins et al. (2016) administered questionnaires to pilgrims attending the 2011 Magh Mela. The questionnaire measured the extent to which participants: (a) shared a social identity with others in the crowd; (b) perceived their interactions and relations with others in the crowd as respectful and intimate (termed ‘relationality’; see also S. S. Khan et al., 2015); (c) judged their experience of participating in the mass gathering as positive; and (d) believed they could enact the ideal Hindu identity (i.e., their salient social identity) during the mass gathering (termed ‘collective self-realisation’; see also S. S. Khan et al., 2016). In regard to the latter, collective self-realisation has been shown in other studies of various types of mass gatherings to be predictive of reports of



positive emotions during and after the gathering (e.g., Drury & Reicher, 2005, 2009). Likewise, perceiving a shared social identity within the crowd and consequently experiencing relationality has been suggested to elicit intensely positive experiences – a sense that one is noticed and valued by others and that one’s beliefs, emotions, and behaviours are validated (Neville & Reicher, 2011). As could be conjectured, Hopkins et al. (2016) found that level of relationality and collective self-realisation were associated with positive experience of the mass gathering. Additionally, perceiving a shared social identity among people in the crowd had a two-fold indirect effect on their positive experience of the mass gathering. Firstly, it increased the sense of being able to enact their shared social identity, and secondly, it increased the sense of relationality with other crowd members. In other words, the pilgrims relished the close and supportive social relationships that developed as a consequence of a shared social identity. It enabled them to cooperate and reach their shared identity-oriented goals which partly explains the positive affect associated with such gatherings.

Perceiving a shared social identity within crowds can further act as a source of strength (Drury & Winter, 2003). A sense of empowerment can arise within crowds through collective action and thus collective self-objectification – the ability to enact shared values and norms associated with a social identity without having them imposed by outgroups (Drury et al., 2005; Drury & Reicher, 2009). For example, activists protested the construction of a road through a green area and consequently managed to prevent the destruction of the green area temporarily. Thus, the activists imposed their collective understanding of legitimacy on events (i.e., they were able to enact their shared values associated with their social identity) which was described by the activists as an exhilarating and empowering experience (Drury & Reicher, 2005). However, the crowds observed by Drury and colleagues were characterised by overt intergroup

conflict contexts. Pehrson et al. (2014) therefore examined the applicability and importance of collective self-objectification in an ostensibly non-confrontational crowd context – the national celebration St Patrick’s Day in Ireland. Crowd members perceived the event as an opportunity to enact their social identities which indeed was experienced as empowering. Similarly, pilgrims at the peaceful Magh Mela who perceived a shared social identity with other pilgrims and experienced collective self-realisation subsequently experienced an increased sense of a salient social identity (i.e., Hindu identity) and behaviour related to the Hindu identity (S. S. Khan et al., 2016).

### ***Physical Proximity***

The annual pilgrimage to Mecca (Hajj) is one of the largest mass gatherings in the world, attracting millions of individuals which ultimately results in an extremely dense crowd and a high risk of crushing (Johansson et al., 2012). Alnabulsi and Drury (2014) conducted a large-scale survey at the Hajj to examine how a shared social identity in the crowd affects perceptions of safety. They found that higher crowd density reduced feelings of safety, but this effect was moderated by social identification with the crowd; pilgrims who highly identified with other crowd members felt safer the denser the crowd was, whereas low identifying pilgrims reported a decreasing sense of safety. The moderation effect could be explained by the perception and expectation that other crowd members were supportive towards them – this expectation of social support increased the more they identified with the crowd. These findings are in line with previous field-based research which investigated the relationship between social identity and crowding. Higher social identification with other crowd members led to feeling less crowded and to a more positive experience (Novelli et al., 2013). This was a validation study of an earlier laboratory-based experiment which showed how participants chose to sit more closely to ingroup members than outgroup members, even

though the two groups were arbitrary and had no prior history (Novelli et al., 2010). In a similar vein, people tend to report a better ‘atmosphere’ in larger crowds than in smaller crowds within a range of mass gatherings (e.g., music festivals and pilgrimages) (Hopkins et al., 2019). Collectively, these studies indicate that a shared social identity in the crowd can be associated with positive experiences, comfort with crowding, and a desire to be physically closer to other crowd members – even if they are strangers.

### ***Risk Perceptions, Risk Behaviours, and Disgust***

Although it is well-established that social identification influences how people evaluate and act on information, whether social identification influences risk perceptions and behaviours has, to date, received very little systematic attention (Cruwys, Greenaway, et al., 2020). Early evidence for a link between a shared social identity and lowered health risk perceptions stems from L. F. Campbell and Stewart (1992) who found that group members underestimate the risks their respective unhealthy norms pose to health (e.g., perceived risk of contracting AIDS from casual unprotected sex and needle sharing in intravenous drug use). A series of studies by Loersch and Bartholow (2011) also provide evidence of the negative link between a shared identity and risk perceptions. In these studies, participants perceived alcohol consumption to pose less risk when presented with beer cans which featured colours of their university compared to a standard beer can. Furthermore, Firing and Laberg (2012) investigated the relationship between personal identity and social identity in a decision-making exercise (jumping versus not jumping into the freezing ocean) among military and police officers. A sense of shared identity with fellow officers was the strongest predictor of jumping, and social identification explained risk-taking behaviour over and beyond personal identity. In a similar vein, people who highly identify with a social group have been shown to exhibit extreme behavioural intentions; high identifiers in Swann et al.’s

(2009) studies were more willing to fight or die for their social group than low identifiers. These findings further demonstrate how social identification with a group can influence group-related behaviour and how people may expose themselves to risk to protect their social groups.

Associated with heightened risk perceptions is a heightened disgust response (Karg et al., 2018) – a feeling of revulsion elicited by potential noxious stimuli (Curtis et al., 2011) – which may explain some of the underlying processes that lead to lowered health risk perceptions and greater risk-taking in social groups. Disgust is a key component of the behavioural immune system which concerns a range of behavioural strategies that humans engage in to minimise the risk of exposure to infection (Murray & Schaller, 2016; Schaller et al., 2015; Schaller & Park, 2011). The disgust response has indeed been argued to have evolved as a defence mechanism – to keep oneself at bay from others' pathogens, especially those of strangers to whom a lack of immunity may exist (Curtis et al., 2011; Faulkner et al., 2004). Because the disgust response prompts people to avoid potentially noxious stimuli, it is likely to produce aversive responses to people who are perceived to signal infection. However, research indicates that the disgust response can be attenuated as a consequence of a sense of shared social identity. For instance, people are not as disgusted by garments that smell of perspiration and used diapers belonging to individuals with whom they share a social identity (Case et al., 2006; Reicher et al., 2016). More specifically, in the study by Reicher et al. (2016), students felt less disgusted by a sweaty t-shirt when it bore their university's logo compared to when it bore a rival university's logo or no logo. The attenuated disgust response was demonstrated both attitudinally (i.e., via self-reported disgust) and behaviourally – the students walked significantly slower to a sink to wash their hands and used less soap after touching the t-shirt with their university's logo.

Naturally, an attenuated disgust response facilitates interaction between group members but could introduce risk as people may let their guard down in social contexts. That is, in the context of a salient shared group membership, group members may not perceive a risk as *a risk* (a ‘false negative’) (see Cruwys et al., 2020). The effect of social identification on the disgust response therefore constitutes both a social cure and a curse but whether this also applies in mass gathering contexts is as of yet unexplored. Negative implications of social identity processes at large for health risk perceptions and behaviours in mass gatherings, in fact, remains largely unexplored.

### **Does the Social Curse Operate in Mass Gatherings?**

This chapter has thus far outlined the premises of the social identity approach and discussed and illustrated the cognitive and behavioural influences of social identity processes in relation to health in small group settings and mass gatherings alike. While the social identity approach to crowds has advanced understandings of crowds, disputing classical crowd theories and unearthing health benefits, little, if any, attention has been given to the implications of social identification for health risk perceptions and behaviours in mass gatherings. This section of the thesis is therefore dedicated to theorising and exemplifying how some social identity processes may negatively impact health risk perceptions and behaviours in mass gatherings – the heart of the matter for this thesis. This will be achieved by reflecting on the previously highlighted cognitive and behavioural consequences of social identification.

Several examples have been provided to elucidate how mass gatherings can be beneficial for health, and these examples provide evidence for how the social cure paradigm extends to mass gatherings. However, does the social curse, or a specific form of the social curse unique to crowd contexts, also operate within mass gatherings in a way that it undermines health risk perceptions and behaviours? The field of mass

gathering medicine generally has a negative outlook on mass gatherings. For example, mass gatherings are typically viewed by the discipline as breeding grounds for diseases, and therefore constitute a ‘curse’ (Abubakar et al., 2012; Hopkins & Reicher, 2017; Kamran Khan et al., 2012). Nevertheless, as emphasised in Chapter 1, mass gathering medicine has focused on physical factors and not investigated whether this curse is linked to (or the equivalent of) the social curse. Pioneering social psychologists (see Hopkins & Reicher, 2016b, 2016a, 2017) have begun to discuss potential negative health consequences of social identity processes in mass gatherings. However, there is, at the time of writing, no empirical evidence in support of these theorisations.

Despite the presented benefits of sharing a social identity with others, it can be surmised that the connectedness it creates may also draw people to more actively interact with others and thereby expose themselves to risk in mass gatherings. People feel *safer* in mass gatherings when they perceive a shared identity with fellow crowd members – a preliminary indication that risk perceptions may be lowered (Alnabulsi & Drury, 2014; Drury et al., 2015). Disgust can potentially explain some of the underlying processes that may lead to greater (but risky) interaction with others. For example, a diminished disgust response as a result of a shared social identity may lead people to become less inclined to notice or less concerned with physical proximity and remain near an infectious coughing crowd member (Alnabulsi & Drury, 2014; Novelli et al., 2010; Reicher et al., 2016). It may further increase willingness to share resources with fellow crowd members (e.g., eating utensils, drinks, and towels) which can facilitate disease transmission (Hopkins & Reicher, 2016b; S. S. Khan et al., 2015; Pellerin & Edmond, 2013). The increased mutual trust and social support within groups may also be implicated in this relationship; crowd members may trust others they perceive a shared identity with not to be infectious and thereby feel safe sharing resources or

engaging in unprotected sex. By the same token, crowd members may feel safe and supported in engaging in risk behaviours, such as drug use at music festivals, because they trust and expect others to help them if something goes astray (Drury et al., 2015; Pandey et al., 2014).

People who identify with a social group adapt their attitudes and behaviours to suit the salient group values and norms rather than their personal values – even if they are detrimental to health (Hogg & Reid, 2006; Oyserman et al., 2007; Tajfel & Turner, 1979). Norms are specific to social identities and will vary depending on the type of mass gathering (Reicher, 2012). Some social identities in mass gatherings may be associated with norms that negatively impact general value placed upon health. For example, norms and values related to being ‘explorative’ and ‘frivolous’ could promote the risky practice of unprotected sex, binge drinking, and drug use at music festivals – common communicable and non-communicable health risks at such events (Briggs & Tutenges, 2014; World Health Organization, 2015). By the same token, rituals at religious events are normative practices associated with the salient religious identity, and some of these rituals may pose a risk to health (Hopkins & Reicher, 2016b). For example, bathing together with millions of other pilgrims and drinking the polluted Ganges water may predispose to a variety of infections (Sridhar et al., 2015).

Furthermore, performing ritualistic behaviour can induce a sense of shared social identity, evoke feelings of agentic control and act as an attentional distraction (Hobson et al., 2018). It is not unfeasible to suggest that people performing rituals in mass gatherings may be less likely to notice or care about imminent health risks or believe that they can overcome or cope with them. People may further be encouraged or encourage fellow crowd members to endure or engage in risky behaviours, including religious rituals, as part of affirming a salient identity (Pandey et al., 2014; Shankar et

al., 2013). In a similar vein, as suggested by Hopkins and Reicher (2016a), group membership may be enhanced or dependent upon completing a mass gathering event (e.g., completing the Hajj at least once is mandatory, with some exceptions, for Muslims). People may therefore persevere and continue their participation despite hardships and poor health. Evidently, norms and values, and associated implications for health, are bound to differ from mass gathering to mass gathering. At music festivals and sports event, they are likely to revolve around hedonism, whereas at religious events they may be about asceticism.

The subjective experience of improvement to health by attending a mass gathering, wherein a sense of shared identity and relationality may be experienced, could lead people to take health advice less seriously, such as wearing face masks (S. S. Khan et al., 2015). Pilgrims may also feel uplifted by collective self-realisation in a religious mass gathering and believe that the Gods will protect them to the extent that they cease to take their medicines, as has been indicated by elderly pilgrims at the Magh Mela (Hopkins & Reicher, 2016b, 2017). Similarly, positive affect, empowerment, collective self-esteem, and intimacy with others that can flow within psychological crowds may lead people to become ‘carefree’ and thereby expose themselves to different health risks (Drury & Winter, 2003; Hopkins & Reicher, 2016b; S. S. Khan et al., 2015).

As expectations of social support and help go hand in hand with experiencing a shared social identity (Drury et al., 2009a, 2009b; Drury et al., 2009), crowd members who are feeling poorly may continue taking part in the mass gathering event instead of seeking medical treatment because they trust and expect others to support them. Likewise, people may experience a false sense of safety and remain in densely crowded areas where there is a high risk of crushing because they are comfortable with crowding and expect others to be respectful and supportive (Alnabulsi & Drury, 2014; Drury et al.,



2015; Novelli et al., 2010). Furthermore, people may jeopardise their own lives to help others who are perceived to share an identity (Drury et al., 2009a; Drury et al., 2009). This is a positive and reassuring outcome, indicating how a shared identity that can contribute to survival and resilience in extreme events. However, if people stop to help fellow crowd members during a human crush, they may also be at an increased risk of being trampled by others. To take another example, if an intergroup conflict arises (e.g., during a demonstration or a sports event), people who highly identify with the crowd may be willing to ‘fight and die’, or more likely injure themselves, in attempt to protect their fellow crowd members (Stott & Drury, 2000; Swann et al., 2009). Likewise, as outlined above, if a crowd member appears poorly from the symptoms of a communicable disease and a fellow crowd member decides to help through physical contact (e.g., by helping the infectious person stand up), this may increase the risk of disease transmission.

### **The Social Cure and Curse Literature: A Caveat**

Although the body of evidence for the social cure, and to a lesser extent, the social curse, is becoming increasingly larger, including in applied contexts, there are notable and important limitations to this maturing research field. The focal point has been to unearth the benefits of social resources and the mechanisms through which they might occur – a research topic addressed almost exclusively through cross-sectional and observational studies (C. Haslam et al., 2016; Steffens et al., 2019). Relatively little is known about the extent to which *interventions* that draw on social identity process exert causal effects in terms of improvements to health (Steffens et al., 2019).

Given that the social identity approach seeks to test the central hypothesis that social identification affects health, the lack of knowledge about the efficacy of such

interventions, which establish causality, is problematic; if this research field endeavours to inform policy and practice, an evaluation of the robustness of the evidence is warranted. Steffens et al. (2019) sought to address this gap through a systematic review and meta-analysis of social identification-building interventions aimed at improving health and identified a modest number of 24 studies to be included in the review. The meta-analysis revealed that the reviewed interventions had a moderate-to-strong overall positive effect on health. While the magnitude of effect varied little across health domains (e.g., stress versus physical health), it varied substantially more depending on the type of interventions. For example, interventions involving group-relevant decision making and therapy programmes were particularly effective in improving health, potentially as a function of enhancement to participants' sense of social support and collective self-efficacy. Interventions involving shared activities and reminiscence, however, had relatively small effects. Steffens et al. (2019) concluded that randomised controlled trials (RCTs) are extremely rare in this research field and that more large-scale high-powered, controlled studies are needed to provide conclusive evidence (e.g., to answer questions about when and for whom specific interventions may or may not be effective); this would be particularly useful for practitioners who wish to draw on such research to inform their practice.

The lack of RCTs is evident and does limit conclusions regarding causal impacts of social identity in applied health settings. There are, at the time of writing, approximately only two psychological interventions that translate the insights from the social identity approach to health into practice in applied settings, which have been evaluated via RCTs and published in peer-reviewed journal articles (see Gee et al., 2019; C. Haslam et al., 2019). One of these interventions is Groups 4 health (G4H; C. Haslam et al., 2016; C. Haslam et al., 2019).

G4H seeks to increase social relationships and reduce distress among socially isolated individuals by building and sustaining group-based social identities and social identification. A pilot study (C. Haslam et al., 2016) showed promising results, whereby those who participated in the programme (relative to matched controls) reported reduced symptoms of depression, anxiety, and loneliness, and an increased sense of connectedness to multiple groups. However, it was a non-randomised controlled trial, limiting strong conclusions about the efficacy of the intervention. To further evaluate the efficacy of the intervention, a Phase II clinical trial (an RCT) was carried out (Haslam et al., 2019). Participants presenting with loneliness in association with clinically severe psychological distress or a diagnosed mental illness were randomly assigned to either the G4H intervention or to treatment as usual. The results mirrored and extended those of the pilot study, demonstrating the efficacy of the intervention over treatment as usual. The effect sizes were moderate to large. However, over half of the participants received other types of treatments for their symptoms (e.g., medication and therapy) alongside the G4H intervention. It is entirely possible that the other treatments played a significant part in the improvement to health.

This thesis broadly aims to explore the implications of social identity processes for health risks in mass gatherings and how social identity processes can inform the design of interventions aimed at mitigating the risks (see the next chapter for specific aims). In view of the comparatively modest body evidence for the causal impact of social identity-based interventions on improvements to health, a cautionary note is warranted in relation to the aims of this thesis. Because translation of the social cure into applied settings, including interventions, is limited, this thesis only offers tentative suggestions for how future interventions in mass gatherings may draw upon social identity processes to mitigate health risks. It is perhaps a leap of faith to assume that social

identity-based health interventions will be effective in as complex and large-scale settings as mass gatherings when current knowledge is so limited even in small-scale settings. However, it is important that interventions are underpinned by theory of social process that accounts for the effects that social group memberships have on perceptions and behaviours (C. Haslam et al., 2016). To this end, this thesis offers a starting point by exploring how interventions aimed at mitigating mass gathering-associated health risks can capitalise on social identity processes.

### **Conceptualising and Operationalising Social Identification**

Before concluding this chapter, an overview of the conceptualisation and operationalisation of social identification seems pertinent, given that it is a central variable of interest in this thesis. Social identification as a construct concerns a variety of subjects addressed within SIT/SCT, and its conceptualisation and operationalisation have received multidisciplinary input (Postmes et al., 2013). A wide range of measures of social identification are available, but there is an ongoing debate that has spanned decades concerning its conceptualisation and operationalisation. A recurrent debate revolves around whether social identification occurs along a single high versus low dimension or should comprise multiple discrete dimensions (Cameron, 2004). Social identification has traditionally been treated as a general connection to the ingroup and operationalised as a unidimensional construct (e.g., Doosje et al., 1995). However, the unidimensional approach has been described as conceptually and empirically insufficient (de Souza et al., 2019; Leach et al., 2008). For example, these criticisms emphasise that social identification connotes both a belief in categorical membership and a set of cognitive beliefs linked to that category, and involves value and emotional significance, which unidimensional measures fail to take into account (e.g., see Ashmore et al., 2004 for an extensive review).

In response to the criticism of the unidimensional approach, multiple multidimensional models of social identification have been developed. For example, Ellemers et al. (1999) identified that social identification consists of cognitive, emotional, and evaluative dimensions which are related but conceptually and empirically distinct (see also, e.g., Bergami and Bagozzi (2000) and Jackson (2002) for comparable models). More specifically, in an experimental study, Ellemers et al. (1999) demonstrated that three aspects of social identity could be distinguished as discrete dimensions in a principal components analysis: ‘self-categorisation’ (the cognitive dimension representing people’s cognitive awareness of their group membership), ‘affective commitment’ (the emotional dimension representing the extent to which people feel emotionally involved with their group), and ‘group self-esteem’ (the evaluative dimension representing the value connotation from a group membership). Another three-dimensional model of social identification, proposed by Cameron (2004), encompasses ‘cognitive centrality’ (time spent thinking about being a group member), ‘ingroup affect’ (positive feelings linked to group membership), and ‘ingroup ties’ (perceptions of similarity and cohesiveness with group members). Despite the efforts to conceptualise and operationalise social identification in a multidimensional manner, there is little agreement concerning the exact number and nature of the dimensions and therefore how it should be conceptualised and operationalised (Leach et al., 2008).

Perhaps the most comprehensive attempt (see Postmes et al., 2013) at bridging and integrating the many multidimensional approaches (e.g., Cameron, 2004; Ellemers et al., 1999; Jackson, 2002) into a single framework is the hierarchical five-dimensional model of social identification by Leach et al. (2008). The model encompasses ‘individual self-stereotyping’ (the extent to which people perceive *themselves* as similar to prototypical ingroup members), ‘ingroup homogeneity’ (the extent to which people

perceive their *entire* ingroup as sharing common aspects), ‘solidarity’ (psychological attachment and commitment to the ingroup), ‘satisfaction’ (satisfaction with group membership, i.e., positive emotions associated with the ingroup membership), and ‘centrality’ (perceiving the group membership as central to one’s sense of self, i.e., an evaluation of the ingroup’s importance to self-definition). These factors fall within two higher order dimensions referred to as ‘group-level self-definition’ (individual self-stereotyping and ingroup homogeneity) and ‘self-investment’ (solidarity, satisfaction, and centrality).

Although there is theoretical and empirical evidence supporting a multidimensional conceptualisation and operationalisation of social identification (e.g., Cameron, 2004; Ellemers et al., 1999; Jackson & Smith, 1999; Leach et al., 2008), single-item measures of social identification have also been proposed and demonstrated good reliability and validity (e.g., see Postmes et al., 2013). Postmes et al. (2013) suggest that the high reliability of the single item ‘I identify with my group’ is primarily attributable to its conceptual clarity and that it “can mean nothing other than that...this concept is understood in the same terms as the multi-component construct of self-investment” (p. 614). They further argue that, overall, social identification as a construct seems to be sufficiently homogenous to be operationalised with one item; a single underlying dimension may be explaining a large proportion of the overall variance. Postmes et al. (2013) conclude by providing recommendations concerning when to use what type of measure. When the distinction between different dimensions of social identification is important, the multidimensional model by Leach et al. (2008) may be appropriate. However, “components should not be differentiated unless researchers can formulate very specific *a priori* predictions regarding their differential effects” (Postmes et al., 2013, p. 614). Taken together, it can feasibly be argued that social identification as a

construct can be, to an extent, conceptualised and operationalised at the discretion of the researcher to suit the objective of the study.

Turning specifically to crowds and mass gathering settings, there appear to be few (if any) debates or recommendations concerning how social identification should be conceptualised and operationalised in these settings. Relatively recent studies within the field of social identification and mass gatherings have used a range of social identification measures, and these have typically been adapted or developed to suit the individual studies. For example, Alnabulsi and Drury's (2014) measures of social identification were partly based on measures developed by Doosje et al. (1998) or their origin was unspecified; S. S. Khan et al. (2016, 2015) and Hopkins et al. (2016) did not specify the origins of employed measures of social identification; Drury et al. (2009) employed Doosje et al.'s (1995) measure of social identification; and Novelli et al. (2013) and Drury et al.'s (2015) measures of social identification were based on measures developed by Doosje et al. (1995, 1998). Multidimensional measures of social identification – primarily based on Doosje et al.'s (1995, 1998) measures – therefore appear to be commonly employed within the social identification and crowd and mass gathering literature. However, it is important to stress that the studies mentioned above have subsequently not differentiated the dimensions (cognitive, emotional, and evaluative) in the analysis and interpretation of the findings. In fact, it appears uncommon for mass gathering and non-mass gathering studies alike in the social psychological literature to separate the dimensions of social identification unless theoretically central to the objective of the studies.

It has been suggested that self-categorisation and shared social identity are conceptually distinct. That is, people in a crowd shift from a personal identity to a salient social identity but they may not perceive co-present others to share this identity (i.e., perceive

others as members of the salient social category) and are therefore unlikely to experience relatedness with others. To emphasise, there is a difference between shared identity ('We are right-wing protestors') and self-categorisation ('I am a right-wing protestor') (see Neville & Reicher, 2011). However, apart from Neville and Reicher's (2011) research, the literature currently appears void of empirical accounts concerning the conceptualisation and operationalisation of social identification in crowds and mass gatherings. Thus, again, it is not unfeasible to suggest that social identification as a construct in crowds and mass gatherings can be, to an extent, conceptualised and operationalised at the discretion of the researcher to suit the objective of the study. This thesis adopts a flexible approach to this end.

In the empirical studies (see Chapter 3 for an overview of the studies) in which social identification was measured, a multidimensional measure (based on Doosje et al.'s (1995, 1995) measures) was used, but the approach was unidimensional. That is, in line with most previous crowd and mass gathering research (e.g., Alnabulsi & Drury, 2014; Drury et al., 2009b; Hopkins et al., 2016; S. S. Khan et al., 2015; Novelli et al., 2013), the dimensions were not differentiated in the analysis and interpretation of the findings. This approach was primarily motivated by the fact that there were no *a priori* predictions regarding the differential effects of different dimensions and that the dimensions are rarely separated conceptually, operationally, and statistically – even in non-mass gathering research (see Postmes et al., 2013). However, in the studies involving systematic reviews of literature examining the relationship between social identification and health risk perceptions and behaviours, every conceptualisation and operationalisation of social identification was considered for inclusion (see Chapters 4 and 6).



## **Concluding Comments**

The introductory chapters to the literature underpinning this thesis have now come to an end. These chapters have introduced the social identity framework (including the conceptualisation and operationalisation of social identification) together with the ‘social cure’ and ‘social curse’ paradigm, presenting a selection of empirical research related to the paradigm. They have further described both the beneficial aspects and perils of mass gathering events and introduced the social identity approach as a theoretical framework for understanding crowd behaviour and related health risk perceptions and behaviours. Furthermore, the chapters have served to highlight a gap in the literature: little, if any, research concerning how social identity processes may undermine health risk perceptions and behaviours in mass gatherings seemingly exists. Whether the social curse also operates in mass gatherings is therefore unclear; however, relevant evidence and theoretical accounts have been presented to illustrate how social identity processes (e.g., disgust, social support, trust, and norms) may underpin health risk perceptions and behaviours in these settings. It is arguably important to fill this gap to ultimately gain insight into how health risk behaviours in mass gathering may be mitigated by drawing on social identity processes. This thesis’ intent is to address this gap, and the next chapter outlines the methods undertaken to do so.

## **CHAPTER 3: An Empirical Overview of the Present Research**

### **Chapter Overview**

This chapter provides an empirical overview of the thesis. First, the literature discussed in the preceding chapters is briefly reiterated, highlighting the gap in the literature and the importance of addressing this gap. Second, the specific research questions of the thesis are presented. Third, the methodological approach taken to address the aforementioned gap in the literature is described and followed by a presentation of the philosophical underpinnings of the thesis. Finally, a concise outline of the empirical studies presented in this thesis is provided.

### **Rationale and Aims**

The literature discussed in the preceding chapters indicates that a sense of a shared social identity can be both beneficial and detrimental to health. The benefits of sharing a social identity with others have been demonstrated in both small group and mass gathering contexts (e.g., see C. Haslam et al., 2018; S. A. Haslam et al., 2009; Jetten et al., 2012; S.S. Khan et al., 2015). Although seemingly no research to date exists on the implications of a shared social identity for health risk perceptions and behaviours in mass gatherings, there are strong indications that it may have a negative impact (e.g., see Hopkins & Reicher, 2016a, 2016b, 2017). The WHO (2015) have identified the neglect, yet importance, of psychosocial factors in mass gathering health research, which are now prioritised in the design and implementation of health interventions. Furthermore, as an emerging and rapidly evolving multidisciplinary field, mass gathering medicine remains theoretically underdeveloped (Memish et al., 2019; Steenkamp et al., 2016). Extending the insights of the social identity approach to health risk perceptions and behaviours in mass gatherings, and consequently providing a theoretical framework for understanding how to mitigate and manage health risk

behaviours, is therefore pertinent. Research investigating the functions of psychosocial factors in aggravating and mitigating health risks in mass gatherings – particularly by examining how shared social identity influences perceptions of susceptibility to communicable and non-communicable health risks and engagement in health risk behaviours – would be valuable to this end and in line with WHO’s (2015) agenda. The insights provided by such research can, for example, contribute to the field of mass gathering medicine and consequently aid the development of interventions to mitigate risks. This, in turn, can reduce the risk of local adversities and pandemics alike, and thus alleviate stresses on healthcare services (Abubakar et al., 2012; Hopkins & Reicher, 2016a, 2016b, 2017; Memish et al., 2012, 2019; Steffen et al., 2012).

This thesis addresses a health issue of global relevance – how social identity processes are implicated in health risk perceptions and behaviours in mass gatherings. It focuses on elaborating existing understandings of the relationship between social identity processes and mass gathering-associated health risks with three aims: (a) to identify existing knowledge and research gaps and thereby directions for future research concerning the relationship between social identity processes and mass gathering-associated health risks; (b) to provide empirical evidence of the theorised negative relationship between a shared social identity and health risk perceptions and behaviours in mass gatherings; and (c) to explore how health interventions aimed at mitigating mass gathering-associated health risks can be improved by drawing upon social identity processes.

### **Research Questions**

This thesis addresses the following research questions:

1. How, and to what extent, does perceiving a shared social identity impact health risk perceptions and behaviours in mass gatherings?
2. What are the processes underlying the theorised negative relationship between perceiving a shared social identity and health risk perceptions and behaviours in mass gatherings?
3. How can the design of health interventions aimed at mitigating health risks in mass gatherings be improved by drawing upon understandings of social identity processes and their functions?

### **Methodological Approach**

Researchers within the social sciences, including psychology, have conventionally tended to exclusively adopt either quantitative or qualitative research paradigms, engaging in vigorous debate to promulgate their chosen paradigm – often referred to as the ‘paradigm wars’ (R. B. Johnson et al., 2007; Tashakkori & Teddlie, 2010).

However, it has been suggested that it is essential to interpret both qualitative and quantitative data to gain a fuller understanding of a topic and that embracing a single method could limit ‘thoughtful’ debate (D. V. House & McDonald, 1998; McMullen, 2002). The mixed methods research approach arose as a third research paradigm in response to the paradigm wars (Creswell & Plano Clark, 2017). Although there is an ongoing debate concerning the definition of mixed methods research, for the sake of simplicity, this thesis adopts the definition provided by Tashakkori and Creswell (2007): “research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry” (p. 4). Put simply, the mixed methods research approach entails adopting both qualitative and quantitative research methods to investigate a topic (Yardley & Bishop, 2015). This thesis entails a

programme of inquiry and thus lends itself to a mixed methods approach – it also involves the adoption of both qualitative and quantitative research methods to investigate the topic area of interest.

This thesis seeks to explore the nature of the implications of social identity processes for health risks in mass gatherings, and how to mitigate the risks, together with a more systematic examination of the topic. Such an endeavour arguably necessitates the employment of a mixed methods approach to best capture and provide a holistic view and understanding of the complex spectrum of health (risks) in mass gatherings, and to ensure triangulation of findings (Creswell & Plano Clark, 2017; Heale & Forbes, 2013). A mixed methods approach has been suggested to be particularly useful in the pursuit of a holistic understanding of a topic for which existing literature is inconclusive and/or equivocal (Venkatesh et al., 2013) – as is the case in relation to the implications of social identity processes for health risk perceptions and behaviours in mass gatherings. Similarly, combining quantitative and qualitative methods allows for a more nuanced understanding of the studied phenomenon than would be possible by adopting a single methodology. Furthermore, quantitative and qualitative methods have been suggested not to be sufficient on their own but combining them ameliorates their individual limitations (Creswell & Plano Clark, 2017). On the one hand, quantitative research arguably does not take into account the context or setting in which participants are situated, participants' individual voices are not heard, and the researcher's personal biases and interpretations are rarely considered. On the other hand, qualitative research does not suffer from these limitations, but generalisability of findings is limited because of small sample sizes and subjective interpretation of data (Creswell & Plano Clark, 2017; R. B. Johnson & Onwuegbuzie, 2004).

A mixed methods approach was considered appropriate for addressing the research aims and questions. First, there is limited evidence of the relationship between social identification and health risk outcomes in mass gatherings, warranting: (a) systematic scoping and reviewing of relevant literature to inform theory and future research directions; and (b) employment of empirical quantitative research to explore the nature of the relationship (e.g., magnitude, direction, and causes). Second, the apparent limited evidence further signals the need for explorative qualitative research aimed at understanding, describing, and interpreting the under-researched phenomenon in question to help guide or modify theory and research (Holloway & Galvin, 2017). The thesis therefore encompasses a combination of theory driven (i.e., deductive approach guided by the tenets of the social identity approach) and theory developing (i.e., inductive approach) research to gain a better understanding of the implications of social identity processes for health risk perceptions and behaviours in mass gatherings and means to mitigate risks. The adopted approach, then, allows for both broad and in-depth understanding and corroboration. On the whole, the mixed methods approach serves to provide unique insights from multiple perspectives into the implications of social identity processes for the aggravation and mitigation of mass gathering-associated health risks.

As with all research, mixed methods research involves philosophical assumptions (Bishop, 2015). Many scholars advocate that ‘pragmatism’ as a philosophical foundation is well-equipped to guide the process of combining quantitative and qualitative methods into a holistic understanding of the phenomenon in question (Creswell & Plano Clark, 2017; Tashakkori & Teddlie, 2010). In the next section, the research philosophy underpinning the thesis is presented.

## **Research Philosophy**

A dilemma attributed to mixed methods research concerns how to combine quantitative and qualitative research underpinned by different philosophical assumptions, which “give rise to fundamental differences in how qualitative and quantitative methods can be used to produce valid ‘knowledge’ of ourselves and our world” (Yardley & Bishop, 2015, p. 1). It should be noted that philosophical assumptions have also been referred to as ‘worldviews’ – a set of beliefs or assumptions about knowledge brought by the researcher to their inquiry, informing the focus, level of analysis, design, and methodology of their research (Creswell & Plano Clark, 2017; Guba, 1990). The worldviews underlying the quantitative and qualitative research paradigms differ in five fundamental ways: what is considered real in the world (the nature of reality; ontology), how people gain knowledge of what they know (the nature of knowledge; epistemology), the role of values in research (axiology), how the research is conducted (methodology), and the language of research (rhetoric) (Creswell & Plano Clark, 2017; Denzin & Lincoln, 1994; Guba, 1987, 1990; Tashakkori & Teddlie, 2010).

The paradigm wars led researchers adopting a mixed methods paradigm to search for an appropriate philosophical foundation to support their methodology, given that the quantitative and qualitative paradigms had their own worldviews to draw upon (Tashakkori & Teddlie, 2010). Traditionally, quantitative research draws on the positivist (or postpositivist) worldview. Simply put, positivists tend to view reality and truth as singular and objective (i.e., independent from the researcher) and take a deductive and controlled approach to research. By contrast, qualitative research is typically rooted in the constructivist (or interpretative) worldview. Constructivists tend to posit that there is no single objective reality or truth but rather multiple and take an inductive approach to research while embracing subjectivity of the researcher (Bishop,

2015; Creswell & Plano Clark, 2017; Pluye & Hong, 2014; Yardley & Bishop, 2015).

These fundamental philosophical differences have sparked debate spanning several decades about whether paradigms *can* or *should* be mixed (Creswell & Plano Clark, 2017; Denzin & Lincoln, 1994; Guba, 1987; R. B. Johnson & Onwuegbuzie, 2004; Tashakkori & Creswell, 2007).

People who have argued against the mixing of methods have been referred to as ‘purists’ (Rossman & Wilson, 1985) and ‘advocates of the incompatibility thesis’ (Howe, 1988). The incompatibility thesis suggests that compatibility “between quantitative and qualitative methods is impossible due to the incompatibility of the paradigms underlying the methods...researchers who combine the two methods are doomed to failure due to the differences in underlying systems” (Tashakkori & Teddlie, 2010, p. 7). In other words, advocates of the incompatibility thesis argue that mixing of quantitative and qualitative methods is inconsistent and therefore inappropriate because it ignores profound epistemological differences – philosophical consistency must be maintained (Hathcoat & Meixner, 2017; Howe, 2002). Today, however, mixed methods research has been established as a third research paradigm, and ‘pragmatism’ has become a prominent (if not the most prominent; e.g., see Bishop, 2015) philosophical foundation for justifying the use of mixed methods research (Feilzer, 2010; Tashakkori & Teddlie, 2010). In line with this, pragmatism underpins the research presented in this thesis.

Through a pluralism position, pragmatism seeks to merge the insights provided by quantitative and qualitative research into a workable solution to advance knowledge (R. B. Johnson & Onwuegbuzie, 2004). It offers an alternative worldview to those of positivism and constructivism and supports the use of both qualitative and quantitative research methods within a programme of research, dismissing the debate concerning



whether paradigms can or should be mixed. Pragmatism also tends to avoid philosophical concepts such as ‘truth’ and ‘reality’ – or focusing on the nature of knowledge – but rather accepts that there are singular and multiple realities that can be studied and embraces a practical and applied research philosophy to guide methodological choices and to solve practical problems in the ‘real world’ (Feilzer, 2010; Tashakkori & Teddlie, 2010). Action rather than philosophising is preferred – pragmatism has therefore been referred to as an ‘anti-philosophy’ position (see R. B. Johnson & Onwuegbuzie, 2004). In essence, pragmatism rejects the dichotomous forced choice between positivism and constructivism with regard to, for example, epistemology and ontology and instead embraces both positions (or is situated between the two positions) (Tashakkori & Teddlie, 2010).

A key characteristic of pragmatism is that it aims to investigate a particular research question, theory or phenomenon with the most appropriate research method (Feilzer, 2010). In other words, researchers drawing on a pragmatic worldview focus on the research problem at hand and use all available approaches (i.e., use pluralistic approaches) to understand the research problem and answer the research question(s). This enables the use of different methods, worldviews, and forms of data collection and analysis, and both inductive and deductive approaches are supported (Creswell, 2014; Feilzer, 2010).

To reiterate, the programme of research presented in this thesis examines how social identity processes are implicated in health risk perceptions and behaviours in mass gatherings and how social identity processes can be drawn upon to mitigate risks. This is a complex and multifaceted topic for which a mixed methods approach was deemed appropriate and for which a ‘non-dogmatic’ philosophical foundation is arguably necessary. However, some might argue that the exclusive focus on social identity

theory/self-categorisation theory in this thesis is dogmatic (i.e., theoretically dogmatic) – but it is methodologically pragmatic. Because pragmatism is a suitable philosophical foundation for mixed methods research that is oriented towards ‘what works’ (i.e., what approach is most appropriate for addressing the research problem and question), providing the researcher with freedom of choice, it is the philosophical foundation underpinning this thesis (Creswell & Plano Clark, 2017; Morgan, 2007, 2014; Tashakkori & Teddlie, 2010). It allowed for both deductive (e.g., to test the theorised relationship between social identification and health risk perceptions and behaviours in mass gatherings) and inductive (e.g., to explore the implications of social identity processes for the aggravation and mitigation from multiple perspectives and contexts) lines of inquiry, valuing both objectivity and subjectivity. In the following section, the empirical studies of the thesis are presented.

### **Overview of Studies**

The studies presented in this thesis involve elaborate syntheses and evaluations of the existing literature, experimental and cross-sectional studies, and consultations with practitioners. More specifically, to be able to address the aims and research questions of this thesis, five different research designs were employed to collect data: a systematic literature review, an experimental vignette study, a cross-sectional survey study, a systematic scoping review, and a qualitative interview and brief survey study. What follows is an outline of the empirical chapters and corresponding studies, with brief descriptions of the employed methods – more detailed accounts and justifications of the methods are provided in the respective chapters. A summary of the key characteristics of the empirical studies presented in this thesis is shown in Table 1.

In chapter 4, Study 1 is introduced: a mixed methods systematic review of the literature examining, synthesising, and appraising existing empirical evidence of the theorised

negative relationship between social identification and health risk perceptions and behaviours in mass gatherings. The study addressed research question one and two of the thesis. Four major databases were systematically searched using specific search term combinations leading to the identification of 142 articles, of which three were quality appraised and included in the review after full-text screening. The included studies did, however, not directly investigate the relationship between social identification and health risk perceptions or behaviours in mass gatherings. Rather, two corollaries of experiencing a sense of shared identity that may negatively implicate health risk perceptions and behaviours in mass gatherings were identified: experiencing a false sense of safety and perceiving risk behaviours to be normative. Based on the findings from this study, it is concluded that the existing evidence of the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gatherings is limited; this warrants further research and justifies the undertaking of subsequent studies and the thesis as a whole.

Turning to chapter 5, two retrospective quantitative studies are presented: an experimental vignette study (Study 2) and a cross-sectional survey study (Study 3). Addressing research question one and two of the thesis, these studies tested the impact of a sense of shared social identification in mass gatherings on health risk perceptions and an underlying mechanism – perceived disgust. Participants in Study 2 were either asked to recall a crowd that they had been part of in which they felt that they shared a social identity with other crowd members (a psychological crowd) or one in which they did not (a physical crowd). Study 3 involved the recruitment of participants that had recently attended a music festival and was employed to replicate the findings of Study 2. In both studies, participants were asked to complete measures of shared social identification, perceived disgust, and health risk perceptions in relation to the crowds

they had been asked to recall. Together, the studies demonstrated that perceiving a shared social identity in mass gatherings lowers health risk perceptions via lowered perceived disgust, supporting the theorised interrelationships between these variables. Study 2 uniquely contributes to the literature by affirming, through an experimental paradigm, that there is a negative effect of a shared social identity on health risk perceptions in mass gatherings. Study 3 further supports these findings through triangulation of data and extends them by focusing on a specific type of mass gathering – music festivals. Together, these studies provided ‘proof-of-concept’ quantitative empirical support for the theorised relationship between social identification and health risk perceptions in mass gatherings.

Chapter 6 presents a mixed methods systematic scoping review of multidisciplinary research (Study 4). Given that Study 1 demonstrated that there is very little, if any, empirical research concerning the negative relationship between social identification and health risk perceptions and behaviours in mass gatherings, the scope of this review was broadened. That is, the study reviewed the implications of social identification for health risk perceptions and behaviours in non-mass gathering settings (i.e., any setting other than crowd settings). The purpose of the study was to identify social identity processes underpinning health risk perceptions and behaviours that may apply to mass gatherings. A systematic search in four major databases was carried out using keywords, MeSH terms (i.e., Medical Subject Headings), and Boolean operators. Following screening of 1751 articles, 90 articles were included in the qualitative synthesis and the articles’ quality was appraised. This study concluded that normative pressure and identity affirmation are key social identity processes that may underpin health risk perceptions and behaviours in mass gatherings. Overall, the study facilitates understandings of the implications of social identification for health risk perceptions

and behaviours, contributes to the identification of social identity processes (i.e., normative pressure and identity affirmation) that may implicate health risk perception and behaviours in mass gatherings and, in turn, provides guidance for future research. The study thus further addressed research question one and two of the thesis.

Chapter 7 describes the concluding study of this thesis which sought to address all three research questions of the thesis: a qualitative interview and brief survey study (Study 5) with 17 mass gathering healthcare professionals (HCPs). The study aimed to explore the perspectives of HCPs on (1) implications of social identity processes for mass gathering-associated health risks and (2) how social identity processes can be drawn upon to inform and improve healthcare practices and interventions in mass gatherings. The interview data were analysed using thematic analysis while the quantitative data were examined using descriptive statistics. Two overarching themes with five and three sub-themes, respectively, were identified: (1) Perspectives on social identity processes and health risks in mass gatherings (sub-themes: The manifestation of a shared identity, Identity shifts and expressions, Breaking social norms, Normative pressure, and Navigating health risks through experience); and (2) Perspectives on the incorporation of social Identity processes into healthcare practices and interventions in mass gatherings (sub-themes: Messages from leaders and fellow ingroup members, Signalling a shared social identity, and Focusing on norms).

The findings suggest that HCPs recognise that processes, such as norms and identity enactment, are implicated in mass gathering-associated health risks. HCPs also perceive value in drawing on social identity processes to inform and improve healthcare practices and interventions. The quantitative findings from the survey corroborate the findings from the interviews. Taken together, the research highlights avenues for future research and collaboration aimed at developing healthcare practices and interventions,

informed by the social identity approach, to manage health risks in mass gatherings. The study method allowed for elaboration and contextualisation of the negative relationship between social identification and health risk perceptions and behaviours in mass gatherings. That is, the study extends the reviews and quantitative studies by introducing a qualitative exploration of social identity processes that may be implicated in negative social identity-health risk relationship in different mass gathering settings – both supporting previously identified processes and unearthing additional key processes. It further allowed for theorisations and recommendations to be made regarding strategies drawing on social identity processes to reduce health risk behaviours in mass gatherings.

**Table 1***Key Characteristics of Included Studies*

	Study 1	Study 2	Study 3	Study 4	Study 5
Overall aim(s)	To synthesise and evaluate current evidence of the negative relationship between social identification and health risk perceptions and behaviours in mass gatherings.	To examine how experiencing a sense of shared social identity in mass gatherings impacts on health risk perceptions.	See Study 2.	To synthesise and evaluate research on the implications of social identification for health risk perceptions and behaviours in non-mass gathering settings.	To explore the perspectives of healthcare professionals on the implications of social identity processes for the aggravation and mitigation of mass gathering-associated health risks.
Method	Mixed methods systematic review	Experimental vignette	Cross-sectional survey	Systematic scoping review	Semi-structured interviews and brief survey
N	3	208	148	90	17
Main analysis	Narrative synthesis (thematic analysis)	MANCOVA and Mediation	Mediation	Narrative synthesis (thematic analysis)	Thematic analysis

## **CHAPTER 4: A Systematic Review (Study 1)**

### **Chapter Overview**

The first two chapters provided an overview of mass gatherings and how the social curse may operate in these settings. This has helped to highlight key social identity processes that may undermine health risk perceptions and behaviours by drawing upon existing literature on the social curse in non-mass gathering settings. In this chapter, the first empirical study of the thesis is presented – a systematic review of the literature. The study sought to synthesise and evaluate the existing (if any) empirical evidence of the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gathering settings. In organising this chapter, the rationale of the study is first presented and followed by a description of what a systematic review constitutes and its uses. Finally, a full description of the study is provided.

### **Introduction**

As promulgated in Chapters 1 – 3, there is a need to further extend the insights of the social identity approach to health in mass gatherings and thereby provide a theoretical framework to advance understanding of health risk behaviours and perceptions in such settings. To briefly reiterate, social identification can negatively impact health outcomes in small group settings (i.e., the 'social curse') but whether the social curse (or equivalent) also extends to mass gathering settings is currently unclear (e.g., see Hopkins & Reicher, 2016a, 2016b, 2017). Furthermore, the WHO (2015) have identified the neglect, yet importance, of psychosocial factors in mass gathering health research. Despite this, the field of mass gathering medicine remains theoretically underdeveloped and in need of a psychosocial element (Hopkins & Reicher, 2016b; Memish et al., 2019; Steenkamp et al., 2016).



Hopkins and Reicher (2016a, 2016b, 2017) provided brief overviews of the literature on social identity and health in mass gatherings and justifications to carry out research within the topic area, particularly focusing on health risks. However, these publications constitute theoretical accounts that have included self-selected literature to support the presented arguments. It remains to determine and document in a rigorous manner whether research concerning social identity and health risks in mass gatherings has developed since the publication of Hopkins and Reicher's theoretical and empirical overviews. More importantly, whether a negative relationship between social identification and health risk perceptions and behaviours exists in mass gathering contexts should be rigorously investigated and documented. To this end, a systematic review of the literature seems an appropriate starting point as they are often undertaken to investigate to what extent existing literature supports a theory (Siddaway et al., 2019). The present study therefore systematically reviewed evidence for the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gathering settings. However, before providing a detailed account of the present systematic review, a description of what systematic reviews are is presented for clarity.

### **What Are Systematic Reviews?**

In this thesis, Moher et al.'s (2009) definition of a systematic literature review is adopted: "A systematic review is a review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review" (p.1). Hence, a systematic literature review must be *systematic* in its methodological approach, *comprehensive* in its scope of identifying and including relevant material, and *reproducible* by others who would undertake the same approach

reported by the author(s) (Fink, 2005). The use of systematic and explicit methods serves to reduce selection bias of studies (i.e., selection of studies already familiar to the authors and/or which corroborate their perspectives) (Higgins et al., 2019). The importance of this structured approach is also emphasised by Rousseau et al. (2009), but who further argue that like any other type of research, systematic reviews are not impervious to the subjectivity of the researcher and therefore require equal effort to ensure objectivity. Likewise, they do not automatically comprise high-quality and reliable evidence but are rather a mean to synthesise available evidence (Siddaway et al., 2019).

Systematic reviews “bring together, synthesise, and critique one or more literatures to provide an overall impression of the extent, nature, and quality of evidence in relation to a particular research question, highlighting gaps between what we know and what we need to know” (Siddaway et al., 2019, p. 749). In other words, systematic reviews can summarise and comment on the state of available evidence and highlight lack of literature in an area and/or the need for high quality research concerning a topic area (Higgins et al., 2019). They have the potential to inform practice and policy by discussing, evaluating, extending or developing theory and are characterised by their explicit methodological, comprehensive, transparent, and replicable approach (Baumeister, 2013; Petticrew & Roberts, 2006). The method allows for the synthesis of available evidence within a topic area and for robust conclusions and implications to be made; gathering, synthesising, and evaluating results from multiple studies allows far more robust conclusions than possible from a single study (Siddaway et al., 2019). Such reviews have gradually become more important in health (and social) research and practice. They enable relevant parties to keep up to date within their field and often

inform the development of policy and practice guidelines, or provide justification for further research (Moher et al., 2009).

To summarise the process of conducting a systematic review, seven standard steps are followed: (1) devising a review question(s); (2) defining eligibility criteria (i.e., criteria for inclusion or exclusion of studies); (3) developing and applying a search strategy in a range of information sources; (4) identifying potentially relevant studies through a screening process of title and abstracts; (5) selecting relevant studies following screening of full texts; (6) appraising the quality of included studies using a quality appraisal tool(s); and (7) synthesising included studies (i.e., the process of collating data from included studies to draw conclusions about a body of evidence; Higgins et al., 2019) (Pluye & Hong, 2014).

While the outlined review steps should be adhered to in a systematic review, there are different approaches to systematic reviewing of evidence. For example, systematic reviews may exclusively include quantitative or qualitative studies or, even more specifically, randomised controlled trials. A more recent approach is that of mixed methods systematic reviews (also referred to as ‘mixed studies reviews’; Pluye & Hong, 2014) which include both quantitative and qualitative data synthesis (Pearson et al., 2015; Sandelowski et al., 2012). Put differently, similar to mixed methods research (see Chapter 3), mixed methods systematic reviews combine the findings of both quantitative and qualitative (or mixed methods) studies to address the review question(s)/objective(s). They are therefore more methodologically inclusive and accessible to a wider audience and are appropriate for multidisciplinary topics (Harden, 2010; Sandelowski et al., 2013).

There are also multiple approaches to data synthesis. For example, most reviews on the effects of interventions employ some form of *statistical* synthesis – typically a meta-analysis which combines and analyses the statistical data from multiple methodologically and statistically similar studies (Higgins et al., 2019). Systematic reviews have to date been largely associated with meta-analysis, but another type of synthesis is *narrative* synthesis which predominantly relies upon the use of text to summarise and describe the findings. Narrative synthesis can be particularly useful when the systematic review addresses broader research questions rather than focuses upon the effectiveness of a specific intervention (Popay et al., 2006; Siddaway et al., 2019). Although mixed methods systematic reviews are becoming increasingly common, quantitative and qualitative data are not often combined in a single synthesis or subsequent final synthesis. Rather, most reviews create a framework based on themes from included qualitative studies and integrate quantitative data within the framework or analyse quantitative and qualitative data separately and then briefly discuss the overall findings (Pearson et al., 2015). Sandelowski et al. (2006) have suggested three frameworks to draw upon when conducting a mixed methods systematic review: segregated, contingent, and integrated. A segregated synthesis maintains a binary distinction between quantitative and qualitative data before the final synthesis. In a contingent synthesis, several syntheses are conducted sequentially and are informed by the preceding synthesis's results. The present study, however, encompasses a mixed methods systematic review employing an integrated synthesis. In an integrated synthesis, quantitative and qualitative data are combined into a single synthesis. The studies included in such a review are grouped for synthesis by findings perceived to address the same or similar research question or aspects of the topic of interest as opposed to by methods (i.e., quantitative and qualitative).

## **Research Question and Objectives**

The present study sought to answer the following research question: “What is the evidence for the negative relationship between social identification and health risk perceptions and behaviours in mass gatherings?” The objectives of the systematic review were to: a) synthesise and evaluate existing evidence of the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gatherings; and b) identify new studies within the topic area since the publications by Hopkins and Reicher (2016a, 2016b, 2017).

## **Method**

### **Design**

A mixed methods systematic literature review was conducted to identify published quantitative, qualitative, and mixed methods research that has investigated the relationship between social identification and health risk perceptions and behaviours in mass gatherings. This ensures a systematic collection of available evidence in a uniform and transparent manner, resulting in a balanced interpretation of the synthesised results (Glasziou et al., 2001; Khalid Khan et al., 2011). Pertinently, such reviews can facilitate understanding of issues central to public health (Pluye & Hong, 2014). The present review is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Liberati et al., 2009; Moher et al., 2009). A protocol was developed and then validated with experts in systematic reviews within the Research Institute for Primary Care and Health Sciences at Keele University (UK). The systematic review was also pre-registered with PROSPERO (ID: CRD42018118878). It should be noted that, henceforth, ‘reviewers’ refers to the author of this doctoral thesis (Daniella Hult Khazaie; DHK) and the primary supervisor of the doctoral research project (Sammyh Khan; SK). As strongly propagated by Cochrane, at

least two reviewers should independently conduct several of the review steps (e.g., study selection and quality appraisal) to minimise the likelihood of errors (Higgins et al., 2019).

### **Search Strategy**

Four key electronic databases were searched from their inception to the 27<sup>th</sup> of June 2018: CINAHL, MEDLINE, PsycARTICLES, and PsycINFO. These databases were searched via EBSCO using keywords and database subject headings (Medical Subject Headings; MeSH terms). Not all databases indexed entries using subject headings – these databases were only searched using keywords. The search was complemented by scanning the reference lists of articles included for full-text screening to identify additional relevant studies. Likewise, studies already known to DHK were included. The Cochrane database was also searched. The searches were limited to records published in the English language involving human subjects.

With reference to relevant research articles and previous literature reviews, search terms were developed to reflect the following three concepts: social identification, health risk perception and behaviour, and mass gatherings. Within each concept, search terms were combined using the Boolean operator ‘OR’ and across concepts using ‘AND’ to search titles and abstracts. Truncation was used to account for different spellings or terminology. Initial scoping searches were carried out to refine the search strategy. As there is no generally agreed upon definition of mass gatherings (Ishola & Phin, 2011), numerous terms were used which had been identified through mass gathering-related research known to the reviewers and located via keyword searches in Google Scholar and EBSCO. Similarly, search terms for the social identification concept not only involved direct social identification and social categorisation terms but also revolved around peer crowds and peer identification to increase inclusivity of the review. The

general search strategy – developed for MEDLINE and subsequently translated into other databases – was as follows:

((MH Social Identification) OR shar\* identi\* OR shar\* social identi\* OR social group\* OR social identi\* OR collective identi\* OR bonding identi\* OR group identi\* OR peer identi\* OR collectivity OR social categor\* OR self categor\*) AND ((MH "Risk-Taking") OR (MH "Health Behavior") OR perceived risk\* OR risk perception\* OR risk\* apprais\* OR perce\* vulnerability OR perce\* susceptibility OR risk\* behavio#r OR risk-taking) AND (mass gathering\* OR crowd\* OR festival\* OR gathering\* OR pilgrim\* OR collective participation OR (Hajj OR Haj OR Hadj) OR Kumbh Mela OR Magh Mela OR Mahakumbh Mela OR Allahabad OR (Makkah OR Mecca) OR Prayag OR Olympic\* OR world cup)

### **Eligibility Criteria**

Articles that met the inclusion criteria were published in peer-reviewed scientific journals and presented primary data (i.e., original research and therefore not reviews, theoretical papers, research agendas, book chapters or conference proceedings) that investigated the influences of social identification on health risk perceptions and/or behaviour in mass gatherings. The construct ‘social identification’ was interpreted broadly in this study to capture the variation within the literature (see Chapter 2). Both unidimensional and multidimensional approaches to conceptualising and operationalising social identification were therefore considered. However, studies that measured social identification were required to have administered measures that involved at least one aspect focused upon self-categorisation as a member of a specific group (i.e., social category) and strength of identification with that social category. No restrictions were applied on how the outcomes needed to be measured (e.g., whether by

self-report means or interview themes). Studies employing any research design and comprising participants of any age and gender were all eligible for inclusion in the review. Studies that did not meet the outlined inclusion criteria were excluded from the review.

### **Study Selection and Data Extraction**

The search results were imported into the reference management software Mendeley ([www.mendeley.com](http://www.mendeley.com)) in which duplicates were removed. Screening of retrieved articles' titles and abstracts was then performed independently by the reviewers using the online screening tool for systematic reviews Rayyan ([www.rayyan.qcri.org](http://www.rayyan.qcri.org)).

Eligible articles' full texts were then located and assessed against the inclusion and exclusion criteria independently by the reviewers. The eligible full-text articles were subsequently re-evaluated for data extraction. Data were extracted by DHK and validated by SK – a process aided by a bespoke data extraction form. The data extraction form was refined through pilot testing by DHK before its use in the review. The data extracted per study included, as appropriate: publication information, aims/objectives, participant characteristics, study context/setting, methods, measures, analysis, and key findings. Any disagreements between the reviewers at any stage were resolved through discussion.

### **Quality Appraisal**

Quality appraisal of the eligible studies was conducted using the Quality Assessment Tool for Mixed Methods Systematic Reviews (QATSDD; Sirriyeh et al., 2012). This tool has been developed for the appraisal of methodological quality of quantitative, qualitative, and mixed methods studies and consists of 16 criteria – 14 applicable to quantitative studies and 14 to qualitative studies. Examples of assessment criteria involve sample size consideration, description of the procedure for data collection, and



justification for the analytical method. Each study was given a score ranging from 0 ('not at all') to 3 ('complete') per criterion. Total scores were subsequently converted into a percentage, and the following categories were used to derive an overall quality assessment: High quality = 75-100%; Moderate quality = 50-74%; and Low quality = 0-49%. The tool has been used in previous mixed methods systematic reviews (e.g., Jenkins et al., 2018). It should be noted that the inclusion of a 4-point scoring scale precludes inter-rater reliability analysis. Consequently, Sirryeh et al. (2012) suggest that quality appraisal should be performed independently by reviewers and subsequently discussed to reach consensus. Quality appraisal was therefore carried out in conjunction with data extraction and was performed independently by the reviewers before discussing the outcomes and resolving any disagreements.

### **Data Synthesis**

Methodological heterogeneity of the included studies precluded performance of a meta-analysis. A narrative synthesis is presented instead for each of the included articles, drawing attention to existing knowledge and gaps in the literature. There are no set principles on how to conduct a narrative synthesis. However, Popay et al. (2006) have developed a guide to improve the systematicity and transparency of narrative synthesis and to reduce bias presented by the reviewed evidence and the reviewer(s). Narrative synthesis appropriately allows for the inclusion of a wide range of research methods (Popay et al., 2006). The narrative synthesis was conducted following the guidelines by Popay et al. (2006) and Siddaway et al. (2019) to increase transparency, ensure a systematic approach, and minimise bias; the analysis drew on the principles of thematic analysis (Braun & Clarke, 2006). This included an analysis of the relationships within and between included studies and a general assessment of the quality of the evidence.

Moreover, quantitative and qualitative studies were combined in the synthesis (see ‘integrated synthesis’; Sandelowski et al., 2006).

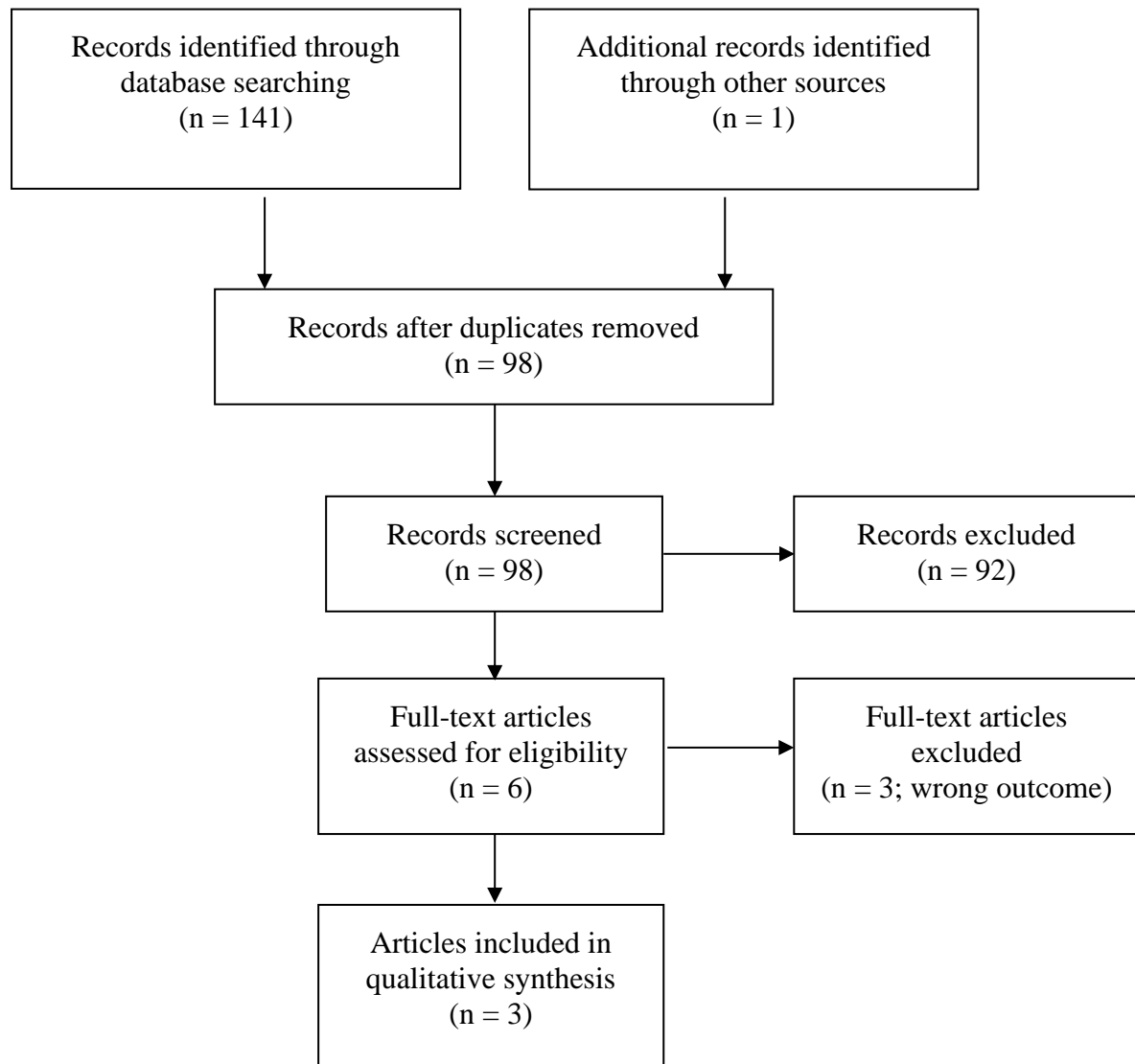
## **Results**

### **Search Results and Overview of Included Studies**

The initial search identified a total of 141 records. After removing duplicates, 97 records remained. After excluding 27 records due to wrong type of publication (e.g., thesis, dissertation or book chapter), 13 wrong outcome (i.e., not assessing health risk perception and/or behaviour), and 52 wrong setting (i.e., not a mass gathering context), and including an article known to the authors, six full-text articles were assessed for eligibility. Three articles were subsequently deemed eligible for inclusion in the systematic review and were published in 2014, 2015, and 2018 (early view – cited as 2019 in this review), respectively. No additional references were located through searching included full-text articles’ reference sections. See the PRISMA flow diagram for an overview of the selection process (Figure 1). Two included articles (Cruwys et al., 2019; Drury et al., 2015) reported two studies, respectively, resulting in a total of five studies included in the final review. The characteristics and quality ratings of the included studies are summarised in Table 2.

**Figure 1**

*PRISMA Flow Diagram of the Selection Process*



**Table 2**  
*Characteristics and Quality Ratings of Included Studies*

Citation	Aim(s)/Objective(s)	Participants	Methods	Social identification measure	Health risk measure	Other data collected	Analysis	Quality
Alnabulsi and Drury (2014)	To examine the role of social psychological factors in crowd safety among pilgrims during the Hajj.	Hajj pilgrims aged 18 years or older (N = 1,194).	Field-based cross-sectional survey.	Two modified 3-item 7-point Likert-type scale measuring self-definition as a Muslim (based on Doosje et al., 1998) and the extent to which other crowd members are perceived as Muslims. A developed 5-item 7-point Likert-type scale measuring strength of identification or sense of unity with the crowd.	Two developed items assessing feelings of safety on the Hajj and in the crowd rated on 7-point Likert-type scales.	Management competence, perceived support, and crowd density.	Descriptive statistics, correlation, regression, mediation, moderation, and analysis of variance.	78% (High)
Drury et al. (2015) Study 1	To test the (quantitative) relation between identification, changes in relations, and resilient outcomes in a dangerous crowd event.	Big Beach Boutique II music event attendees aged 25 – 19 years (N = 48).	Retrospective questionnaire.	One modified 3-item 7-point Likert-type scale measuring identification with the crowd (based on Doosje et al., 1995, 1998).	Three developed measures assessing feeling safe (three items), expectations that others in the crowd would help (one item), and trust in crowd members to deal with an emergency (three items) rated on 7-point Likert-type scales.	Collective self-regulation and interaction with strangers.	Descriptive statistics, <i>t</i> -test, correlation, and mediation.	58% (Moderate)

**Table 2** (continued)

Citation	Aim(s)/Objective(s)	Participants	Methods	Social identification measure	Health risk measure	Other data collected	Analysis	Quality
Drury et al. (2015) Study 2	To examine the accounts by both event safety professionals and participants of the risks they faced during Big Beach Boutique II and the nature of solutions to these risks.	Crowd safety professionals at Big Beach Boutique II (N = 10) and attendees (N = 10).	Retrospective semi-structured interviews and analysis of video and archive materials.	Not applicable.	Not applicable.	Not applicable.	Thematic analysis and discursive psychology techniques.	See Study 1
Cruwys et al. (2019) Study 1	To explore the impact of attending a youth mass gathering on mental health and profile attendees likely to be experience mental illness.	Schoolies attendees aged 16 – 19 years (Australia). Wave 1 (Day 1 of event) N = 217. Wave 2 (data across follow-up time points was collapsed) N = 30.	Field-based survey with follow-ups administered on day 1, 3, 5, and 7 of event.	Two single item social identification 7-point Likert-type scales (based on Postmes et al., 2013) to measure identification with fellow mass gathering attendees and their friendship groups, respectively.	Modified 6-item 7-point Likert-type scale assessing perceived prevalence and acceptability of risk-taking behaviours within the friendship group (injunctive and descriptive norms).	Mental health, attitudes towards other groups, and trait impulsivity.	Descriptive statistics, chi-square, regression, and <i>t</i> -test.	71% (Moderate)

**Table 2** (continued)

Citation	Aim(s)/Objective(s)	Participants	Methods	Social identification measure	Health risk measure	Other data collected	Analysis	Quality
Cruwys et al. (2019) Study 2	See Study 1.	Schoolies attendees. Wave 1 (Day 1 of event) N = 333. Wave 2 (Day 4 of event) N = 263.	2-wave field-based survey administered on day 1 and 4, independent samples.	See study 1.	Identical to Study 1, with a new addition: 6-item 7-point Likert-type scale assessing perceived risk of engaging in six different risk-behaviours in the mass gathering.	Identical to Study 1, with new additions: connection to friends and size of social network at Schoolies.	Descriptive statistics, chi-square, moderation, and t-test.	See Study 1

In summary, of the three included articles, two employed quantitative methods and one employed mixed methods. More specifically, four out of five of the included studies employed quantitative methods, administering surveys regarding mass gathering events. One study employed a qualitative method involving semi-structured interviews and analysis of video and archival materials. Study samples and settings differed considerably; Alnabulsi and Drury's (2014) and Drury et al.'s (2015) samples comprised adult Muslim pilgrims and music festival attendees and crowd safety professionals, respectively, whereas Cruwys et al. (2019) recruited adolescents from a secular festival. All studies indicated that social identification might indirectly affect health risk-related perceptions – actual behaviour was not assessed. The articles did not employ the same measures of social identification, nor assessed the same health risk outcomes. The health risk outcomes related to social identification in mass gatherings were a sense of safety and expectations that others will help/be supportive (Alnabulsi & Drury, 2014; Drury et al., 2015) and perceptions of risky group norms (Cruwys et al., 2019). The studies are thus grouped and presented under the following two themes: 'A Sense of Safety' and 'Risky Group Norms'. It should be noted that the authors of the included studies may not necessarily have referred to the health risk outcome measures as *health risk* outcome measures – the reviewers, nonetheless, deemed these measures to be valid to refer to as health risk outcome measures based on their relevance to health risks.

## **Themes**

### ***A Sense of Safety***

Alnabulsi and Drury's (2014) study was conducted at the 2012 Hajj Muslim pilgrimage to Mecca (Saudi Arabia) to examine the role of social psychological factors in crowd safety. The study examined crowd density and the effect of social identification on

perceived safety in the crowd. A cross-sectional survey was administered to pilgrims at the Hajj, assessing social identification, perceived safety, and management competence. The study provided clear descriptions of recruitment, data collection, and analysis. The Likert scales used in this study were developed for the study with one exception - a scale assessing identification as a Muslim was partly based on measures from previous research. All scales yielded acceptable Cronbach's alpha values, but their psychometric properties were not tested further. It should be noted that the density of the crowd was also only visually estimated by the researchers.

The findings revealed that crowd density was negatively associated with perceived safety; however, this negative relationship was moderated by social identification with the crowd and the perception that others identified as Muslim. Low identifiers perceived reduced safety with greater crowd density, whereas high identifiers perceived increased safety with greater crowd density. Likewise, pilgrims who highly perceived other crowd members to identify as Muslims were unaffected by increases in crowd density. These findings could be explained by the perception that others in the crowd were supportive (and expectations of such support), which was higher the more the pilgrims identified with the crowd, as shown through mediation analysis. Although the authors suggest that the research provides evidence for the role of crowd behaviour in facilitating safety within dense crowds, they also note that the opposite may be true. That is, feeling safe as a consequence of experiencing shared social identification could lead event attendees to gravitate to dense parts of the crowd.

The two studies conducted by Drury et al. (2015) employed retrospective study designs wherein participants were asked recall a near disaster event nine years later: Big Beach Boutique II in 2002, Brighton (UK) – a free outdoor music event. The near disaster occurred when triple the number of people the event organisers had planned for



attended the event, overwhelming the emergency services and resulting in people blocking emergency exits and limiting access for vehicles. As the tide came in and reduced space, people tried to evacuate the beach, increasing the risk of a human crush and leading to some crowd members becoming distressed. Despite the perilous situation, there were no casualties as a consequence of overcrowding.

In Study 1, a survey assessing identification with the crowd, interaction with strangers, feeling safe, collective self-regulation, expectations of help, and trust in crowd members to deal with an emergency was administered to people who attended the event. All measures bar the modified identification measure were developed for the study.

Cronbach's alphas were acceptable for all measures, but their psychometric properties were not further assessed. The sample size is very small, as is not surprising given data was collected nine years after the event, but the authors acknowledged this limitation in the discussion. The data collection procedure lacks detail; it is unclear how participants received and completed the survey and details regarding ethical considerations have not been provided (e.g., if and how consent was obtained and ethical approval – this is also applicable to Study 2). Nonetheless, the analysis plan and procedure were justified and described in good detail; however, no form of power analysis is reported. The main results, involving mediation analyses, demonstrated that identification with the crowd positively predicted feeling safe directly and indirectly through expectations of help. This resonates with Alnabulsi and Drury's (2014) findings.

In Study 2, video and archive materials analysis was carried out together with semi-structured interviews with people who had professional roles in crowd safety at the event and crowd members; the interviews sought to examine their accounts of the risks they encountered during the event and solutions to these risks. While the process and choice of analysis have been well described and justified – thematic analysis and

discursive psychology techniques – it is unclear which authors were involved in the analysis to ensure reliability of the analytical process. The findings demonstrated that the archive materials and crowd safety professionals tended to refer to ‘panic’ in the crowd. Crowd safety professionals referred to ‘disorder’ in the crowd and experienced a loss of control. The crowd members, on the other hand, did not perceive ‘disorder’ as representative or a serious issue and, despite agreeing that the professionals had lost control, their feelings of safety were seemingly unaffected by this – suggested by some to be a result of the positive atmosphere in the crowd. Moreover, crowd members reported solving conflicts themselves in the crowd rather than passively ignoring them. Finally, some of the professionals believed that disaster was averted through their own efforts and that further control and coercion can resolve crowd risks. By contrast, some other professionals referred to the crowd’s ability to self-organise and that mutual support within the crowd contributed to averting disaster.

### ***Risky Group Norms***

The two studies by Cruwys et al. (2019) were conducted in Australia in the context of the week-long youth mass gathering ‘Schoolies’ in 2015 (Study 1) and 2016 (Study 2) for Australian school leavers, predominantly aged 17 and 18 years. Both studies provided clear and detailed descriptions of recruitment, data collection, and analysis. Study 1 explored the impact of attending Schoolies on young people’s mental health and profiling of youth at risk, taking into account social identity processes. The first wave of data was collected on the first day of the mass gathering, and the same participants were invited to complete identical follow-up surveys every other day during the event. The surveys contained measures of mental health, social identification, attitudes towards other groups at Schoolies, norms for risk-taking, and trait impulsivity. These measures were either standardised, adapted from previous

research or developed for the study, demonstrating acceptable Cronbach's alphas but no further assessments of their psychometric properties were carried out. However, it is reported that the minimum alpha value for the four scales assessing attitudes toward other groups at Schoolies was .59 – this was not further addressed.

The key findings revealed that event attendees' mental health improved over time, compared to their age peers, and this effect was particularly pronounced among participants who highly identified with fellow event attendees. However, participants who identified less with fellow event attendees experienced more psychological distress. These participants perceived risk-taking behaviours to be more common and acceptable within their friendship groups and held more negative attitudes towards other groups in the mass gathering (i.e., other attendees, the police, and volunteers). For example, they perceived other attendees to be less fun and the police to be less safe. It should also be noted that more psychologically distressed attendees were less likely to identify with their friendship groups, but this was not statistically significant ( $p = .055$ ).

A prominent issue with this study was the high attrition rates for the follow-up surveys – less than 14% of the 217 participants who completed the survey on day one of the mass gathering provided 'usable' follow-up data. However, the authors do not explain what is meant by 'usable' follow-up data. It is therefore unclear whether, for example, participants did not provide data or if some provided data that was not usable.

Nonetheless, to counteract the attrition issue, the authors collapsed the data across the different follow-up time points to generate a Wave 2 data set, resulting in a total of merely 30 included participants. Data from the day five time point was used from participants who had completed the survey at multiple follow-up time points.

Conclusions drawn from the longitudinal data therefore need to be made with caution.

Study 2 employed similar methods. To rectify the high attrition rates of Study 1, an independent samples design was implemented whereby participants were surveyed on the first and fourth day of the event. Hence, a between-subjects design precludes a 'true' longitudinal design (although, it can be argued that such a short interval between the two data gathering time-points weakens any longitudinal effect claims regardless). New additions to the survey included measures of connection to friends, size of social network at Schoolies, and risk perception for behaviours likely to cause injury or death (e.g., unprotected sex, excessive alcohol consumption, and taking a drink from a stranger). These measures were either adapted from previous research or developed for the study. Cronbach's alpha or other psychometric properties were not reported for the measures also used in the preceding study, but the reported alpha for one of the new measures was acceptable.

The key findings broadly replicated those of the first study. Participants who had attended the event for three days and who highly identified with other event attendees reported better mental health than those who had just arrived. Moreover, predominantly male and ethnic minority participants who held negative attitudes towards other groups at Schoolies felt socially isolated and perceived risk-taking behaviours to be more common and acceptable within their friendship groups and were more likely to experience psychological distress. Participants who were more psychologically distressed were less likely to feel that they belonged, identified, and trusted their friendship groups and dangerous behaviours were also seen to be less risky. The authors concluded that these two studies had shown that mass gatherings might exhibit mental health benefits for attendees - especially among those who experienced the mass gathering as an enactment of an important social identity and a connection to other attendees. Moreover, they profiled attendees at risk at youth mass gatherings.

### **Excluded Full-Text Screened Articles**

The three articles that were excluded after full-text screening were excluded on the basis of not incorporating measures of health risk perceptions and/or behaviour (or proximal measures of these). On the contrary, and similar to Cruwys et al. (2019), two of these articles focused on the prophylactic corollaries on health of participating in mass gatherings (S. S. Khan et al., 2015; Tewari et al., 2012). These studies showed how shared social identification could lead to improved subjective health via relationality – i.e., the degree to which one experiences interactions and relations with others to be respectful, understanding, and supportive. The third excluded study, on the other hand, illustrated how social influences (i.e., social identity, subjective norms, and group norms) positively predicted intentions to revisit a music festival (Choo et al., 2016). More specifically, satisfaction with the festival was the strongest predictor of revisit intentions, followed by social identity (i.e., affective, cognitive, and evaluative social identification with companion visitors), and subjective norms and group norms (e.g., goal to visit the festival with companions).

### **Discussion**

This systematic review of the literature sought to examine the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gatherings and identify new publications in the topic area since the theoretical publications by Hopkins and Reicher (2016a, 2016b, 2017). Application of the eligibility criteria to the results of the searches identified three publications (totalling five studies) for inclusion in the review.

The included studies indicate that experiencing a sense of shared social identity in mass gatherings may implicate health risk perceptions, in two contrasting ways. First, Alnabulsi and Drury (2014) and Drury et al. (2015) demonstrated how crowd members

who identified with the crowds felt safe in dense areas of the crowds – attributable to perceived social support from other crowd members. This indicates that social identification may lower health risk perceptions as people may ignore the risk of crushing and even seek out dense areas in the crowd as they feel safe and supported by other crowd members. That is, crowd members who experience a sense of shared identity with the crowd may not perceive a potential risk as posing a risk. Second, Cruwys et al. (2019) showed how a lack of connection with other crowd members was related to perceiving risk-taking practices to be normative and less risky in a youth mass gathering. Furthermore, attendees who lacked social connection (i.e., identified less with others) held more negative attitudes towards other groups at the event – they may therefore be less likely to seek assistance when in need, medical or otherwise.

On the one hand, Cruwys et al.'s (2019) findings contradict the proposition that experiencing shared social identification can undermine health risk perceptions and behaviours in mass gatherings – it is rather the lack of social identification that can evoke beliefs about risky norms. On the other hand, the findings indicate that health interventions could focus on making event attendees that are likely to feel socially isolated feel socially included. Such targeted interventions could reduce beliefs regarding normative risk-taking among socially isolated attendees. Nonetheless, an alternative explanation is that crowd members that feel socially isolated (i.e., that do not feel a sense of shared identity) may endorse and engage in risk behaviours perceived to be normative for reasons of social approval (i.e., a wish to feel that they 'belong' in the crowd). This is not an unreasonable interpretation given that a large body of literature has identified that conformity to norms can be motivated by a desire to gain affiliation or social approval (e.g., Cialdini & Goldstein, 2004; Wood, 2000). It raises the question of whether people may be motivated to engage in risky behaviours to signal social

identification in any given setting. Overall, then, there appears to be some contrasting evidence of a relationship between social identification and health risks in mass gatherings, but it is too diminutive to draw any firm conclusions.

The three articles included in this study have been published within the last decade (2014, 2015, and 2019) - a clear indication of how this field of research is still in an emerging phase. This is a surprisingly small number given recent advocacy for the application of psychosocial factors (World Health Organization, 2015), and social identity theory specifically (Hopkins & Reicher, 2016a, 2016b, 2017), to the study of health risks in mass gatherings. Hopkins and Reicher discussed both Alnabulsi and Drury's (2014) and Drury et al.'s (2015) studies – Cruwys et al.'s (2019) publication was, at the time of the literature search, the only new addition to the literature concerning the relationship between social identification and health risk perceptions and behaviours in mass gatherings.

The investigation of the influences of social identification on health risk perceptions and behaviours in mass gatherings has raised several issues regarding how this topic can be studied further. A prominent issue is that none of the studies included in this review explicitly or directly assessed the relationship between social identification and health risk perceptions and/or behaviours in mass gatherings. More specifically, Alnabulsi and Drury (2014) and Drury et al. (2015) did not specify that their studies set out to examine health risk perceptions or behaviour – nor did they refer to their measures of safety perceptions as direct or proximal measures of health risk perceptions. It is, however, not unreasonable to suggest that feelings of safety can be considered a proximal measure of health risk perception, given that one may, for example, experience a false sense of safety in a hazardous situation. Similarly, health risk perceptions or behaviours were not the focus of Cruwys et al.'s (2019) studies.

More importantly, the samples in both Study 1 and 2 were divided into two groups based on their psychological distress scores (i.e., those with elevated psychological distress versus the rest of the sample) and risk propensity of these two groups was compared. The influence of social identification on health risk perceptions and behaviour was therefore not directly assessed. Thus, no firm conclusions can be drawn regarding the implications of social identification for health risk perceptions and behaviours in mass gatherings – this relationship needs to be further investigated.

It is evident that there is a need to explore a greater variety of types of mass gatherings; the studies included in this review investigated a youth mass gathering for school leavers in Australia, a near disaster music event in the UK, and the Muslim pilgrimage to Mecca. Although this provides contrasting and culturally diverse perspectives, considering the breadth of types of mass gatherings, ranging from political demonstrations and sports events to music festivals, there is still room for research with a focus on other types of events. Attendees of music festivals and school-leaver gatherings may typically endorse hedonistic norms and values whereas attendees of pilgrimages and religious festivals may subscribe to ascetic norms and values. This is important to reflect upon as it likely has implications for health risk perceptions and behaviours. Elucidating how health risk perceptions and behaviours may differ between mass gatherings and further establishing the effect of shared social identity in relation to this seems a pertinent avenue for future research. Relatedly, corroborating the processes highlighted in this review and identifying additional processes underlying the potentially negative relationship between experiencing a shared social identity and health risk perceptions and behaviours in mass gatherings would be highly valuable. Moreover, none of the studies included in this review examined actual behaviour in the mass gatherings – future research should aim to address this.



Initial research does not necessarily need to be field-based, particularly as theory and research in the topic area are, evidently, still largely in an emerging phase. Although with a potential drawback on ecological validity, future studies employing experimental methods could be conducted to examine the effects of social identification on health risk perceptions and behaviours and provide ‘proof of concept’ evidence. Research on crowd scenarios conducted in experimental settings, including virtual reality, has shown promising results (e.g., see Drury et al., 2009; von Sivers et al., 2014). Furthermore, and in line with Drury et al.’s (2015) research, to gain a more nuanced perspective on crowd behaviour and health risks, future research should not only obtain event attendees’ accounts – these should also be complemented by the views of those who manage mass gathering events and provide medical services in these settings.

### **Strengths and Limitations**

There are several strengths and limitations of this review that need to be addressed. The broad search strategy allowed for a comprehensive search of the available literature. On the one hand, the broad inclusion criteria may have led to the inclusion of studies that did not directly address the review question (i.e., none of the included studies directly assessed the effect of social identification on health risk behaviours or perceptions). On the other hand, the review has consequently transparently highlighted the lack of research in the topic area but still been able to confer proximally relevant findings. Due to time and funding constraints, this review only considered English language articles published in peer-reviewed journals which may have introduced bias, and the small number of studies limits the generalisability of the results. Moreover, the search was carried out in early 2018 – any studies published since this date that meet the inclusion criteria have not been included in this review. This is important to note since this is an emerging field in the literature concerning psychological factors and health in mass

gatherings. There are also strengths and limitations of the included studies to consider. Although it can also be considered a strength, the diversity of samples and study settings limits the generalisability. Despite the overall good methodological quality of the included studies, the study designs limit the ability to infer causality. Moreover, the studies primarily used modified or developed measures of social identification and health risk-related outcomes, limiting generalisability and claims of reliability.

## **Conclusion**

The systematic review has highlighted that the existing evidence of the negative relationship between social identification and health risk perceptions and behaviours in mass gatherings is limited. However, it is important to reiterate that none of the included studies explicitly or directly assessed the relationship between social identification and health risk perceptions or behaviours. There are, nonetheless, indications that a shared identity or lack of a shared identity with the crowd may undermine health risk perceptions through a false sense of safety and risky norms, respectively. There is nevertheless not sufficient research to draw any firm conclusions regarding the influences of social identification on health risk perceptions, and health risk behaviours in particular, in mass gatherings. Knowledge is currently limited to three publications which have not directly assessed the relationship between these variables. Further work is needed to affirm whether a negative social identity-health relationship exists and the processes by which it is underpinned. Expanding knowledge in relation to this could warrant the development and implementation of social identity theory-informed health interventions to mitigate mass gathering-associated health risks. This is in line with the overall aim of the thesis; the systematic review has therefore highlighted the need for the thesis' outlined programme of research.

## **CHAPTER 5: An Experimental Vignette Study and a Cross-sectional Survey**

### **Study (Study 2 and 3)**

#### **Overview of Chapter**

This chapter presents two empirical quantitative studies examining the implications of a shared social identity for health risk perceptions and perceived disgust in mass gatherings. A manuscript presenting these studies has been published in the *British Journal of Social Psychology* (see Hult Khazaie & Khan, 2020). Apart from slight alterations to increase clarity in relation to the thesis (e.g., appendices), it is the published manuscript that is presented following an introduction to the studies and the description of a pilot study.

#### **Introduction**

In Chapter 4, Study 1 concluded that limited empirical evidence exists concerning the theorised negative relationship between social identification and health risk perceptions and behaviours in mass gatherings. This paucity paves the way for research examining the theorised negative social identity-health risk relationship in mass gatherings. To this end, Study 2 (an experimental vignette) and 3 (a cross-sectional survey) of this thesis were conducted and examined the implications of a shared social identification for health risk perceptions and perceived disgust in mass gatherings. Before presenting a full description of the studies, it is important to explain the decisions made about the research design and methodology (this is expanded upon in the manuscript presented below).

Study 2 addresses, to an extent, one of the prominent methodological weaknesses within the social and health literature that was outlined in Chapter 2 – the lack of experimental research to allow for claims of causation concerning the effects of social identification on health (Cohen & Janicki-Deverts, 2009; Jetten et al., 2014b).

Examining and understanding the direction and nature of causal relationships has been described as the cornerstone of science, and this can be achieved through experimental studies (Shadish et al., 2002). On the one hand, experimental studies often enhance internal validity, through control of settings and independent variables, at the cost of external validity, through oversimplified and unnaturalistic settings (Aguinis & Bradley, 2014; Argyris, 1975). On the other hand, the experimental *vignette* methodology (also termed ‘factorial survey’) – which combines principles from classical experiments and survey methodology – has been suggested to address this limitation, enhancing both internal and external validity, through the presentation of meticulously constructed and realistic scenarios to assess dependent variables (Aguinis & Bradley, 2014; Atzmüller & Steiner, 2010; Steiner et al., 2016). The methodology therefore increases experimental realism while allowing for the manipulation and control of independent variables (Aguinis & Bradley, 2014).

Vignette studies involve presenting short descriptions of a person, object or situation (vignettes) to elicit participants’, for example, beliefs, attitudes or intended behaviour in relation to the presented vignettes (Atzmüller & Steiner, 2010). Study 2 employed an experimental (retrospective) vignette design: participants read a description of social identification and physical versus psychological crowds and were subsequently asked to recall either a physical or psychological crowd of which they had been part. They were then asked to complete the study measures revolving around beliefs and intended behaviour with respect to hypothetical scenarios in the crowd (see ‘Methods’ below for a detailed description). This methodological approach was chosen because it allowed to empirically *test* the theorised social identity-health risk relationship in mass gatherings, establishing both the direction and nature of the relationship, and indeed allowed for claims of causation. Naturally, establishing whether the theorised negative relationship

exists, and the nature of the relationship, is arguably essential before embarking on an exploration of means to mitigate risks by drawing upon social identity processes. The limitations of this approach are considered in detail in the manuscript but, in brief, revolve around the retrospective nature of the approach, which may result in memory distortion.

Study 3 employed a cross-sectional (retrospective) survey design within the context of music festivals. This study was primarily conducted for triangulation of evidence. Triangulation involves the use of more than one research approach (Study 2 and 3) addressing the same line of inquiry to increase confidence in the findings via confirmation of a proposition using multiple independent measures (i.e., to corroborate findings; e.g., see Heale & Forbes, 2013). The focus on a specific type of mass gathering also provided insight into if, and if so, how the social curse may operate in this type of event.

Turning to mechanisms potentially underlying the theorised social identity-health risk relationship in mass gatherings, disgust was considered an appropriate starting point (see Chapter 2 for an overview of disgust). More specifically, disgust may arguably be implicated in a range of health risk behaviours associated with disease transmission that may plausibly occur in mass gathering contexts – from unprotected sex and sharing of resources (e.g., blankets, ritualistic paraphernalia, food, and drink) to aversion to visibly infectious crowd members. Examining disgust was therefore considered fundamental, particularly given that disease transmission is the most serious mass gathering-associated health risk (Abubakar et al., 2012; Gautret & Steffen, 2016; Tam et al., 2012) and that social identification attenuates the disgust response (Reicher et al., 2016). The disgust response is also associated with heightened health risk perceptions

(Karg et al., 2018). Disgust was tested as a mediator (i.e., underlying mechanism) in the social identity-health risk relationship in both Study 2 and 3.

Notably, neither of the two studies were field-based – primarily for practical and ethical reasons and considerations. Gaining access to mass gathering events as a sole PhD researcher was considered difficult and time-consuming. As mentioned in Chapter 1, research studies within music festivals in particular are relatively limited – partly because of the driving commercial interests involved that are unsupportive of research being carried out within the festivals in attempt to prevent negative publicity (Martinus et al., 2010). For example, in the conduct of Study 5 of the thesis involving interviews with mass gathering healthcare professionals, emails were sent to a large number of music festival organisers and medical teams for the purpose of recruiting participants; however, only a fraction of the recipients responded, of which the majority were dismissive. Furthermore, in relation to Study 5, a medical team at the Lourdes pilgrimage participated in the study, but the recruitment process spanned over six months due to gatekeeping reasons.

Turning to ethical considerations, collecting data specifically within music festivals is not straightforward. First, many festival attendees are likely to be intoxicated, which raises issues concerning informed consent. Second, the author of this thesis is a female researcher – collecting data in an environment with intoxicated attendees as a lone female may pose risks. These barriers were overcome by sampling participants who had recently attended a music festival using an online cross-sectional survey design.

Nonetheless, it should be stressed that the primary objective of the two studies was to provide tentative, or ‘proof-of-concept’, empirical evidence in support of the, so far, theorised negative social identity-health risk relationship in mass gatherings, and its underpinnings. The chosen study designs were deemed appropriate to this end.

## Pilot Study

To test the adequacy of modified and developed measures to be included in the main studies, and to test the feasibility of Study 2 (referred to as ‘Study 1’ in the manuscript; Study 3 of the thesis is referred to as ‘Study 2’ in the manuscript), a pilot study identical in design to Study 2 (i.e., an experiment; see the manuscript below) was carried out. A total of fifty participants were recruited via the crowdsourcing platform Crowdfunder ([www.crowdfunder.com](http://www.crowdfunder.com)) to take part in the pilot study.

The reliability of all measures was assessed. The measures of shared social identity (SSI;  $\alpha = .96$ ), perceived disgust (PD;  $\alpha = .91$ ), likelihood of engaging in health risk behaviours (HRBLI;  $\alpha = .78$ ), and perceived riskiness of engaging in health risk behaviours (HRBRI;  $\alpha = .81$ ) demonstrated high reliability. The measure of perceived vulnerability to disease (PVD) displayed low reliability ( $\alpha = .53$ ). However, this was not considered problematic because alpha values have been low and varied in previous research (e.g., alpha values of .45, .50, and .60; e.g., see Prokop et al., 2013; Sawada et al., 2017). More importantly, Cronbach’s alpha as an estimate of reliability assumes unidimensionality (Graham, 2006). The original PVD measure comprises two dimensions, but the developers have suggested treating the measure as unidimensional (Duncan et al., 2009). Previous research has accordingly calculated composite unidimensional scores from the measure (e.g., see Sawada et al., 2017; Thompson, 2010).

The dimensionality of each measure was assessed via principal components analyses (PCAs) with oblimin rotation and Kaiser normalisation. SSI (eigenvalue: 3.56; total variance: 89.09%), PD (eigenvalue: 4.49; total variance: 64.19%), HRBLI (eigenvalue: 2.10; total variance: 69.85%), and HRBRI (eigenvalue: 2.18; total variance: 72.59%), respectively, converged into one-component solutions. The PVD items loaded onto two

distinct components, explaining 33.00 and 26.24% of the variance, respectively (eigenvalues: 2.31 and 1.84).

The means for the two experimental conditions (a shared social identity condition and a no-shared social identity condition) were inspected and are presented in Table 3.

**Table 3**

*Table of Means Per Experimental Condition*

Measure	Condition	
	Shared social identity	No-shared social identity
SSI	7.72	3.77
PD	5.90	6.11
HRBLI	3.19	2.76
HRBRI	2.91	2.63
PVD	5.87	5.96

*Note:* SSI = Shared social identity; PD = Perceived disgust; HRBLI = Likelihood of engaging in health risk behaviours; HRBRI = Perceived riskiness of engaging in health risk behaviours; PVD = Perceived vulnerability to disease.

No means, bar HRBRI, flagged any issues. Mean HRBRI was, against predictions, higher in the shared social identity condition compared to the no-shared social identity condition, but not significantly so ( $p = .32$ ). Despite this, it was decided that the measure was to be used in the main studies because of the small sample size of the pilot study and because HRBRI is a ‘follow up’ measure of HRBLI, which did not flag any issues. Overall, the pilot study did not raise any significant alarms. The main studies were therefore pursued as planned. What follows is the published manuscript.



## **Abstract**

Previous research concerning mass gathering-associated health risks has focused on physical factors while largely neglecting the role of psychological factors. The present research examined the effect of experiencing shared social identification on perceptions of susceptibility to health risks in mass gatherings. Participants in Study 1 were asked to either recall a crowd in which they shared a social identity with other crowd members or a crowd in which they did not. Participants subsequently completed measures assessing shared social identity, disgust, and health risk perceptions. Study 2 involved administering the same measures as part of a survey to participants who had recently attended a music festival. The results from both studies indicated that sharing a social identity lowered health risk perceptions; this effect was indirect and mediated via disgust. This highlights the importance of considering social identity processes in the design of health communication aimed at reducing mass gathering-associated health risks.

## **Shared Social Identification in Mass Gatherings Lowers Health Risk Perceptions via Lowered Disgust**

Large crowd events, or mass gatherings, such as music festivals, pilgrimages, and sports events, pose serious health risks (The World Health Organization (WHO), 2015).

Examples of non-communicable health risks include crush injuries, environmental stressors, and trauma incidences related to substance misuse (Steffen et al., 2012).

However, the most serious health risk is the transmission of communicable diseases.

Being in close physical proximity to masses of people, under often rudimentary living conditions, increases the risk of infection, which may spread beyond the bounds of the mass gathering (Abubakar et al., 2012; Dixon et al., 2013; Memish et al., 2012; Tam et al., 2012). Research to date has emphasised physical factors in the transmission of disease in mass gatherings, and thereby physical means of mitigating risks (e.g., disease surveillance and implementation of facemasks and vaccines; (Kamran Khan et al., 2012; Tam et al., 2012). However, more recently the WHO has come to identify the neglect, yet importance, of psychological factors in mass gathering health research, which are now prioritised in the design and implementation of interventions to mitigate mass gathering-associated health risks (WHO, 2015).

The social identity approach (Tajfel & Turner, 1979; Turner et al., 1987) provides a theoretical framework for making sense of how psychological processes implicate health outcomes in mass gatherings. As a conceptual tool, the framework distinguishes between two types of crowds – physical and psychological crowds (Reicher, 2012). On the one hand, people in physical crowds happen to be in the same place at the same time by chance and retain a strong sense of unique personal identity despite being among many ‘others’ (e.g., travellers at a busy train station). On the other hand, participants in psychological crowds convene for a common purpose, as is the case at music festivals,

pilgrimages, and sports events. They perceive one another to belong to the same social group and assume a shared social identity (e.g., 'we/us' festival-goers). Their behaviour is in turn motivated by the norms and values perceived to be characteristic (prototypical) of the group (Hopkins & Reicher, 2016b; Reicher, 2012; Reicher et al., 2007). The difference in crowd dynamics between physical and psychological crowds is an important distinguishing feature in the design and implementation of health interventions in mass gatherings in that psychological factors are fundamental to interventions designed for psychological crowds.

The experience of sharing a social identity makes crowds psychologically transformative as it motivates a mutual desire for proximity, social support, trust, respect, and cooperation (Drury et al., 2009a, 2009b; Novelli et al., 2010; Tyler & Blader, 2000). These cognitive and relational transformations also underpin positive health outcomes in mass gatherings. For example, pilgrims at a Hindu festival in India – the Magh Mela – reported improved subjective health over time to the extent that they experienced a sense of shared social identity and perceived their relations with other pilgrims to be intimate and supportive (S. S. Khan et al., 2015). Similarly, attendees of an Australian festival for school leavers reported mental health benefits to the degree that they identified with other attendees; in contrast, those who experienced psychological distress were more likely to report social isolation and negative attitudes towards other groups in the mass gathering (i.e., other attendees, the police, and volunteers; Cruwys et al., 2019).

However, the experience of sharing a social identity, at least in small group settings, may also result in negative health outcomes. Evidence from small group settings has shown that the association is partly attributable to the adherence to unhealthy group norms (e.g., smoking and alcohol consumption; Livingstone et al., 2011; Oyserman et

al., 2007; Tarrant & Butler, 2011) Furthermore, the risks such behaviours pose to health tend to be underestimated by group members (e.g., perceived risk of contracting AIDS from casual unprotected sex and needle sharing in intravenous drug use; L. F. Campbell & Stewart, 1992). Still, the negative effects of norms and lowered health risk perceptions on health outcomes in mass gatherings have so far only been theorised. One factor other than norms believed to underpin negative health outcomes in mass gatherings, particularly health risk perceptions, is the disgust response (Hopkins & Reicher, 2016a; 2017). Disgust – a feeling of revulsion elicited by potential noxious stimuli – has been proposed to be an evolved defence mechanism to avoid others' pathogens, especially strangers' pathogens to which the immune system is likely ill-prepared (Curtis et al., 2011; Faulkner et al., 2004). Naturally, disgust sensitivity is associated with heightened health risk perceptions (Karg et al., 2018). Perceived and experienced disgust therefore affects how people interact with one another – people are indeed less disgusted by those with whom they share a social identity (Case et al., 2006; Reicher et al., 2016).

Given that the disgust response is attenuated between people who share a social identity, it raises the question of whether this process could lead to lowered health risk perceptions in mass gatherings. For example, people experiencing a shared social identity may become less concerned with physical proximity and remain near an infectious crowd member, or it may increase resource sharing (e.g., eating utensils and towels) – a known facilitator of disease transmission (Dixon et al., 2013; S. S. Khan et al., 2015; Pellerin & Edmond, 2013). Likewise, people experiencing a shared social identity who are feeling unwell (and may be infected by a virus) may avoid seeking medical help because they expect and receive support from other crowd members (Hopkins & Reicher, 2016a). Pilgrims at the Magh Mela in fact reported helping other

sick pilgrims and expressed that such support was normative and thereby reciprocated; they also described becoming more tolerant of other pilgrims' asocial actions (e.g., being pushed) and expressed that they expected practical help (e.g., resource sharing) from other pilgrims to overcome hardships at the event (Pandey et al., 2014).

There is a lack of research examining how social identity processes are implicated in negative health outcomes in mass gatherings. Evidence indicating that social identity processes can lead to negative health outcomes does not emanate from mass gatherings – this relationship has only been theorised and there currently only exists tentative empirical evidence in support of the proposition. There is therefore a need for research to examine how social identity processes may contribute to health risks associated with mass gathering events. To this end, the aim of the present research was to examine how experiencing a sense of shared social identity in mass gatherings impacts on health risk perceptions. Two studies were conducted drawing on samples of individuals who had been part of either a physical or a psychological crowd (Study 1) and recent attendees of music festivals (Study 2). The studies examined whether sharing a social identity with other crowd members was associated with lowered health risk perceptions and whether this relationship was underpinned by lowered perceived disgust. We wish to highlight that the motivation behind the research was to provide tentative, or proof-of-concept, empirical evidence in support of the so far theorised negative effect of sharing a social identity on health risk perceptions in mass gatherings, and its underpinnings. This is reflected in the design and scope of the studies.

## **Study 1: An Experimental Vignette Study**

### **Method**

#### **Design and Sample**

This study employed a between-subjects design wherein participants were asked to recall either a physical or a psychological crowd of which they had been part. The design of the study is in line with previous research that has examined retrospective accounts of the experience and outcomes of sharing a social identity in crowds (e.g., Drury et al., 2009a, 2009b; Drury et al., 2015). Participants (N = 208) were recruited online via the crowdsourcing platform Crowdfunder ([www.crowdfunder.com](http://www.crowdfunder.com)) from the United Kingdom and the United States to complete a survey in the survey tool Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)); the information sheet and consent form used in this study are presented in Appendix A and B, respectively. See Buhrmester et al. (2011) and Mason and Suri (2012) for an overview of the validity and reliability of data collected via crowdsourcing. The sample was drawn from the United Kingdom and the United States as it enabled sampling from two countries with equivalent levels of English-language proficiency.

Participants were first presented with an outline describing and giving examples of social identities in line with the social identity approach, and the main difference between a physical and psychological crowd (descriptions and instructions provided to participants are outlined in Appendix C). Providing this information was essential to the manipulation of the study – it ensured participants could discern the category of crowd that they were asked to recall; participants remained blinded to the specific research question throughout the study procedure. Participants were randomly allocated to one of two experimental conditions (the independent variable): a shared social identity condition versus a no-shared social identity condition. Participants in the shared social

identity condition (N = 102) were asked to ‘*recall a time [they] were in a very large crowd of people where [they] felt that [they] shared a social identity with other crowd members (a psychological crowd)*’. Participants in the no-shared shared social identity condition (N = 106) were asked to ‘*recall a time [they] were in a very large crowd of people where [they] felt that [they] did not share a social identity with other crowd members (a physical crowd)*’. They were also asked to write down the crowd they were thinking about; their responses served as a qualitative manipulation check to ensure that they had a type of crowd in mind (physical versus psychological) consistent with the condition to which they had been allocated while completing the study measures.

Finally, participants were asked to complete the dependent measures assessing shared social identity, disgust, and health risk perceptions in relation to the recalled crowd.

Responses from 350 participants were originally collected, but 142 participants were removed from the data set after data screening as: (1) 50 completed <50% of the survey; (2) seven failed an attention check; (3) 24 completed the survey from an IP address outside the United Kingdom or the United States; (4) 57 provided blank, bogus, or incorrect answers to a qualitative manipulation check which ascertained whether participants recalled the type of crowd they were asked to recall (physical versus psychological crowd; see manipulation checks below for details); and (5) four were identified as univariate outliers as their z-scores derived from a measure exceeding  $\pm 3.29$  (Tabachnick & Fidell, 2007). Of the final sample (N = 208), 107 (51.4%) participants were from the United States and 101 (48.6%) from the United Kingdom, of which 83 (39.9%) were male and 125 (60.1%) were female; age ranged from 18 to 78 years (M = 38.52, SD = 13.00).

Sample size was determined based on two planned analyses. First, using G\*Power (Faul et al., 2007), it was estimated that a sample size of 135 would be required to achieve

80% power with medium global effect sizes for the planned multivariate analysis of covariance (MANCOVA). Second, following recommendations by Fritz and MacKinnon (2007), it was estimated that a sample size of 78 would be necessary to achieve 80% power in case the magnitudes of the relationships in the planned percentile bootstrap mediation models were medium in size ( $\alpha = .39$ ;  $\beta = .39$ ). Estimations of global effect sizes were based on previous research examining relationships and interactions between social identification, health-related outcomes, and/or disgust that yielded medium to large effect sizes (e.g., Novelli et al., 2010; Reicher et al., 2016; Tarrant & Butler, 2011). Ethical approval was obtained from Keele University's Ethical Review Panel (ERP3138; see Appendix D for the letter of approval); all participants gave their informed consent prior to their participation.

## **Measures**

### ***Measure of Shared Social Identity***

*Shared social identity* (SSI) with crowd members was measured on a four-item scale adapted from Doosje et al. (1995, 1998). Example items include the following: '*I identified with other people in the crowd*' and '*I was similar to other people in the crowd*'. The scale was anchored by the endpoints 1 = 'Strongly disagree' and 7 = 'Strongly agree'; higher scores indicate greater shared social identity. This measure also served as a manipulation check.

### ***Measure of Perceived Disgust***

*Perceived disgust* (PD) was assessed with seven items adapted from Tybur et al. (2009) and Olatunji et al. (2007). Participants indicated how disgusted they would feel in seven different hypothetical scenarios if they had occurred in the crowd. Example items include the following: '*Sitting next to a crowd member who has red sores on their arm*' and '*Shaking hands with a crowd member who has sweaty palms*'. The scale was



anchored by the endpoints 1 = ‘Not at all disgusting’ and 7 = ‘Extremely disgusting’; higher scores indicate greater perceived disgust.

### ***Measures of Health Risk Perceptions***

*Perceived vulnerability to disease* (PVD) was measured by seven items adapted from Duncan et al. (2009). Example items include the following: ‘*I would have avoided using public toilets because of the risk that I may have caught something from other crowd members*’ and ‘*I was more likely to catch an infectious disease in the crowd*’. The scale was anchored by the endpoints 1 = ‘Strongly disagree’ and 7 = ‘Strongly agree’; higher scores indicate greater perceived susceptibility to infectious diseases and emotional discomfort in situations where disease transmission is likely.

*Likelihood and perceived riskiness of engaging in health risk behaviours* (HRBLI and HRBRI) were assessed using two complementary scales comprising four items, respectively. These measures were broadly based on existing measures of risk perception (Hampson et al., 2003; Weber et al., 2002). The items were designed to examine health risk perceptions in relation to behaviours that might plausibly occur in mass gatherings and were centred around resource sharing and physical contact.

Example HRBLI items include the following: ‘*If you were extremely thirsty and a crowd member offered you a bottle of water they had been drinking from, how likely is it that you would have drunk from the bottle?*’ and ‘*If another crowd member displayed flu-like symptoms and suddenly felt too fatigued to stand up on their own, how likely is it that you would have physically supported them?*’ HRBLI was anchored by the endpoints 1 = ‘Extremely unlikely’ and 7 = ‘Extremely likely’; higher scores indicate greater likelihood to engage in health risk behaviours and thus lower risk perception.

The HRBRI item was as follows: ‘*How risky would it be for you to do this in relation to your health?*’ This item was repeated after each HRBLI item (i.e., the scale comprised

four identical items). HRBRI was anchored by the endpoints 1 = ‘Not at all’ and 7 = ‘Extremely’; higher scores indicate greater perceived riskiness of engaging in health risk behaviours and thus higher risk perception.

### **Measurement Properties**

Before proceeding with the inferential statistics, the dimensionality of each measure was assessed separately through principal components analyses (PCAs) with oblimin rotation and Kaiser normalisation. Shared social identity (eigenvalue: 3.54; total variance: 88.61%), perceived disgust (eigenvalue: 3.45; total variance: 49.30%), likelihood of engaging in health risk behaviours (eigenvalue: 2.27; total variance: 56.66%), and perceived riskiness of engaging in health risk behaviours (eigenvalue: 2.20; total variance: 55.10%), respectively, converged into one-component solutions. The perceived vulnerability to disease items loaded onto two distinct components, explaining 33.98 and 23.49% of the variance, respectively (eigenvalues: 2.38 and 1.64). However, in line with previous research (e.g., see Duncan et al., 2009; Sawada et al., 2017; Thompson, 2010), a composite score was used in the analyses. Finally, a PCA (oblimin rotation and Kaiser normalisation) including all measures was conducted to examine the discreteness of the measures. The results revealed that the items loaded onto six distinct components and that these corresponded to the pre-defined measures (eigenvalues ranged from 1.38 to 5.62 and the six components explained 63.10% of the total variance). Mean scores were calculated for all scales. All items used in the study and factor matrices are provided in Appendix E.

### **Manipulation Checks**

First, responses to the qualitative manipulation check, ensuring that participants had recalled a crowd concordant with the condition to which they had been allocated, were assessed independently by the authors. The inter-rater reliability was  $\kappa = .86$  (95% CI

[0.79, 0.94]), indicating an ‘almost perfect agreement’ (Landis & Koch, 1977).

Disagreements were subsequently resolved through discussion (a detailed account of the inter-rater reliability process is provided in Appendix F). As noted above, 57 participants were excluded because they had provided a blank or bogus response (e.g., a string of random letters) or not recalled the type of crowd they were asked to recall in the condition to which they had been allocated (e.g., participants allocated to the shared social identity condition who recalled a physical as opposed to psychological crowd). Second, participants allocated to the shared social identity condition reported experiencing significantly greater shared social identity ( $M = 5.79$ ,  $SD = 1.01$ ) compared to participants allocated to the no-shared social identity condition ( $M = 2.58$ ,  $SD = 1.28$ ;  $t(206) = 20.02$ ,  $p < .001$ ,  $d = 2.78$ ).

### **Analysis Plan**

The main analysis was conducted in two steps. First, a one-way MANCOVA was employed to examine whether there were any significant differences between the two conditions in perceived disgust and health risk perceptions. Second, mediation analyses were performed to test whether the effects of shared social identity on health risk perceptions could be explained by perceived disgust. Country, age, and gender were entered as covariates in both steps. The main analyses were re-run with outliers, without covariates, and with participants who failed the qualitative manipulation check – the findings from these analyses did not deviate significantly from the findings reported herein.

## **Results**

### **Descriptive statistics, Reliability Analyses, and Correlations**

The Cronbach’s alphas, means, standard deviations, and correlations for the included measures are presented in Table 4.

**Table 4***Cronbach's Alphas, Means, Standard Deviations, and Correlations*

	Measures									
	SSI		PD		PVD		HRBLI		HRBRI	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
<b>Samples</b>		$\alpha$		$\alpha$		$\alpha$		$\alpha$		$\alpha$
Total	4.16	.96	4.90	.83	4.55	.65	2.88	.74	2.63	.73
	(1.98)		(1.08)		(.99)		(.91)		(.75)	
SSIC	5.79	.89	4.68	.80	4.38	.66	3.07	.72	2.58	.66
	(1.01)		(1.06)		(1.02)		(.90)		(.68)	
NSSIC	2.59	.87	5.11	.84	4.73	.61	2.71	.75	2.68	.77
	(1.28)		(1.05)		(.93)		(.89)		(.81)	
<b>Measures</b>	<i>r</i>		<i>r</i>		<i>r</i>		<i>r</i>		<i>r</i>	
SSI			-.12		-.17*		.23**		-.01	
PD					.38**		-.37**		.44**	
PVD							-.20**		.31**	
HRBLI									-.17*	
HRBRI										

*Note:* \* $p < .05$ ; \*\* $p < .01$ ; SSI = Shared Social Identity; PD = Perceived Disgust; PVD = Perceived Vulnerability to Disease; HRBLI = Likelihood of Engaging in Health Risk Behaviours; HRBRI = Perceived Riskiness of Engaging in Health Risk Behaviours; SSIC = Shared Social Identity Condition; NSSIC = No-shared Social Identity Condition.

### Mean Differences

A one-way MANCOVA was conducted to examine differences between the conditions on perceived disgust, perceived vulnerability to disease, likelihood of engaging in health risk behaviours, and perceived riskiness of engaging in health risk behaviours.

The omnibus MANCOVA revealed a significant multivariate main effect for condition,  $Box M = 20.60$ ,  $p = .028$ ;  $F(4, 200) = 4.02$ ,  $p = .004$ , Wilks'  $\Lambda = .93$ ,  $\eta_p^2 = .07$ . Power to detect the effect was .91. Country ( $F(4, 200) = 2.15$ ,  $p = .076$ , Wilks'  $\Lambda = .96$ ,  $\eta_p^2 =$

.04), age ( $F(4, 200) = 1.42, p = .228, \text{Wilks}' \Lambda = .97, \eta_p^2 = .03$ ), and gender ( $F(4, 200) = 1.63, p = .168, \text{Wilks}' \Lambda = .97, \eta_p^2 = .03$ ) were all non-significant covariates in the model. Given the significance of the overall test, the univariate main effects were examined through a series of one-way ANCOVAs which were conducted as follow-up tests to the MANCOVA. A Bonferroni adjustment was applied whereby statistical significance was accepted at  $p < .0125$ . Significant univariate main effects for condition were obtained for perceived disgust ( $F(1, 203) = 8.88, p = .003, \eta_p^2 = .04$ ), perceived vulnerability to disease ( $F(1, 203) = 6.76, p = .010, \eta_p^2 = .03$ ), and likelihood of engaging in health risk behaviours ( $F(1, 203) = 9.32, p = .003, \eta_p^2 = .04$ ), but not perceived riskiness of engaging in health risk behaviours ( $F(1, 203) = .90, p = .343, \eta_p^2 = .00$ ). None of the covariates were significant in any of the ANCOVA models. These results indicate that participants allocated to the shared social identity condition perceived less vulnerability to disease and disgust compared to participants allocated to the no-shared social identity condition. Participants in the shared social identity condition also reported greater likelihood to engage in the health risk behaviours than participants in the no-shared social identity condition did. However, there was no difference between the conditions in perceived riskiness of engaging in these behaviours.

### **Mediation analyses**

Mediation analyses using PROCESS version 3.0 (Hayes, 2017) were performed to examine whether differences in health risk perceptions could be explained by differences in perceived disgust between the conditions. More specifically, the analyses examined the indirect effect (mediating role) of perceived disgust in the relationship between shared social identification and health risk perceptions. The direct effect does not need to be significant to establish mediation – it is the indirect effect that denotes

mediation (referred to as ‘indirect-only mediation’, see Zhao et al. (2010). Condition was entered as the independent variable ( $X$ ), health risk perception (Model 1 = perceived vulnerability to disease; Model 2 = likelihood of engaging in health risk behaviours; Model 3 = perceived riskiness of engaging in health risk behaviours) as the dependent variables ( $Y$ ) and finally perceived disgust as the mediator ( $M$ ) in the model. As condition was coded on  $X$  using a single unit difference (no-shared social identity condition = 1, shared social identity condition = 2), the direct and indirect effects can be interpreted as mean differences on  $Y$  (Hayes, 2017). The three mediation models were tested using 5,000 bootstrap resamples and 95% percentile bootstrap confidence intervals; the indirect effects are considered statistically significant if zero is not within the confidence intervals. Country, age, and gender were entered as covariates in all models. The total, direct, and indirect effects from the models are shown in Table 5.

**Table 5**

*Total, Direct, and Indirect Effects from the Mediation Analyses*

Measure	Total Effect	Direct Effect	Indirect Effect	LLCI	ULCI
PVD	<i>Coeff</i> = -.35, <i>SE</i> = .13, <i>p</i> = .010	<i>Coeff</i> = -.21, <i>SE</i> = .13, <i>p</i> = .103	<i>Coeff</i> = -.14, <i>SE</i> = .05	-.2456	-.0437
HRBLI	<i>Coeff</i> = .38, <i>SE</i> = .12, <i>p</i> = .003	<i>Coeff</i> = .25, <i>SE</i> = .12, <i>p</i> = .037	<i>Coeff</i> = .13, <i>SE</i> = .05	.0421	.2380
HRBRI	<i>Coeff</i> = -.10, <i>SE</i> = .10, <i>p</i> = .345	<i>Coeff</i> = .04, <i>SE</i> = .10, <i>p</i> = .713	<i>Coeff</i> = -.13, <i>SE</i> = .05	-.2305	-.0473

*Note:* The independent variable is the experimental condition and the mediator variable is perceived disgust in all models; LLCI = Lower Level Confidence Interval; ULCI = Upper Level Confidence Interval; PVD = Perceived Vulnerability to Disease; HRBLI = Likelihood of Engaging in Health Risk Behaviours; HRBRI = Perceived Riskiness of Engaging in Health Risk Behaviours.

The direct effects show that participants allocated to the shared social identity condition reported greater likelihood to engage in health risk behaviours than participants allocated to the no-shared social identity condition. The direct effects onto perceived

vulnerability to disease and riskiness of engaging in health risk behaviours were not significant. Examining the indirect effects reveals that differences in health risk perceptions between the conditions could be explained by differences in perceived disgust. More specifically, the reporting of lower health risk perceptions (i.e., lower perceived vulnerability to disease and perceived riskiness of engaging in health risk behaviours, and greater likelihood of engaging in health risk behaviours) in the shared social identity condition was indirect and mediated via perceived disgust.

### **Discussion**

This study set out to examine whether the experience of sharing a social identity in a psychological crowd lowers health risk perceptions via lowered disgust. The results showed that participants who recalled a crowd in which they experienced a shared social identity reported lower perceptions of disgust and health risks compared to participants who recalled a crowd in which they did not experience a shared social identity. The results also showed that the effect of sharing a social identity on lowered health risk perceptions was mediated by lowered perceived disgust. Albeit retrospective in nature, the study offers a preliminary empirical basis for how sharing a social identity in mass gatherings can undermine health risk perceptions through lower levels of disgust.

One limitation of this research is that it was a vignette study and relied upon retrospective judgements. People tend to view the past through rose-tinted glasses. That is, their recollection of an event is often more positive than their actual experience at the event ('rosy view'; Mitchell et al., (1997), and positive affect associated with the event fades slower than negative affect ('fading affect bias' (FAB); Ritchie et al., (2015). According to FAB, positive experiences elicit positive affect when recalled, whereas negative experiences elicit less negative affect when recalled (Skowronski et al., 2014).

By the same logic, it is possible that participants who recalled an event in which they had experienced a shared a social identity, and thereby greater positive affect (Hopkins et al., 2016), were more likely to have experienced positive affect during the recall of the event. They may subsequently have reported lower perceived disgust and susceptibility to health risks than they actually perceived at the event. This prompted the second study examining the same processes in a sample of participants that had recently attended a music festival. That is, participants in Study 2 were asked to recall their experiences of the same type of crowd event in the recent past (i.e., a music festival within the last 4 weeks) rather than any type of crowd event at any time in the past.

## **Study 2: A Cross-Sectional Study**

### **Method**

#### **Design and Sample**

Study 2 employed a cross-sectional survey. Participants (N = 148) from the United Kingdom who had recently (within 4 weeks of completing the study) attended music festivals in the United Kingdom were recruited via the crowdsourcing platform Prolific ([www.prolific.ac](http://www.prolific.ac)); the information sheet and consent form used in this study are presented in Appendix G and H, respectively. The sample was drawn from the United Kingdom as it enabled administration of the survey in English and because the authors had greater knowledge of the music festivals organised in the United Kingdom and their respective timings. The study was launched during a time-period (mid-July) when multiple music festivals in the United Kingdom had either recently taken place, were ongoing, or about to commence. The 4-week cut-off point was specified to enable recruitment from a large pool of music festival attendees to maximise the possibility that an optimal sample size could be reached. Furthermore, studies have demonstrated



that people tend to be able to recall events accurately within 4-week timeframes (e.g., Budge et al., 2016; Valuri et al., 2005; Weinfurt et al., 2014). Participants were presented with a survey in the survey tool Qualtrics (www.qualtrics.com) and were first asked to report which music festival they had attended most recently and when they had attended the festival. Participants were subsequently prompted to complete the study measures in relation to the music festival they reported having attended most recently (e.g., *‘Thinking about [music festival], please indicate the extent to which you agree with the following statements’*). The study measures were counterbalanced whereby the placement of measures assessing health risk perceptions and perceived disgust were, at random, presented either before or after the measure of shared social identity.

Responses from 220 participants were originally collected, but 72 participants were removed as: (1) seven completed less than 50% of the survey; (2) one completed the survey from an IP address outside the United Kingdom; and (3) 64 had not attended a music festival within 4 weeks of completing the study. Of the final sample (N = 148), 50 participants were male (33.8%), 97 were female (65.5%), and one participant (.7%) defined themselves as ‘Other’. Ages ranged from 18 to 64 years (M = 33.76, SD = 11.50). It was estimated that a minimum of 78 participants would be required to achieve 80% power in case the magnitudes of the relationships in the planned percentile bootstrap mediation models were medium in size ( $\alpha = .39$ ;  $\beta = .39$ ; Fritz & MacKinnon, 2007). Ethical approval was obtained from Keele University’s Ethical Review Panel (ERP3155; see Appendix I for the letter of approval); all participants gave their informed consent prior to their participation.

## **Measures**

The same measures used in Study 1 were administered, with a slight alteration in that crowd members were referred to as ‘festival-goers’. Furthermore, while the shared

social identity measure served as a manipulation check in Study 1, it was included as a predictor variable in Study 2.

### **Measurement properties**

Confirmatory factor analyses (CFAs) with maximum likelihood estimation were conducted in two steps. The first step involved examining whether the factor structures from the exploratory factor analyses (Study 1) of the respective measures could be supported. The second step involved examining the measures in a single model to ensure that the dimensionality and discreteness of the respective measures could be supported. The comparative fit index (CFI), the standardised root mean square residual (SRMR), and the root mean square error of approximation (RMSEA) were used to evaluate model fit. Values above .90 for the CFI and below .10 for the SRMR and RMSEA indicate acceptable fit – for an evaluation of the fit indices, see Hu and Bentler (1999) and Schermelleh-Engel et al. (2003). All models exhibited acceptable to good fit (CFI ranged from .914 to 1.000; SRMR .010 to .083; and RMSEA .000 to .093), with only slight modifications (i.e., a total of four within-measure error correlations were specified due to overlap in item content (Byrne, 2010). CFA model diagrams and respective fit indices are presented in Appendix J.

### **Analysis plan**

Similar to Study 1, the main analysis involved conducting mediation analyses to examine whether perceived disgust would mediate the relationship between shared social identity and health risk perceptions.

## **Results**

### **Descriptive statistics, reliability analyses, and correlations**

Table 6 presents descriptive statistics, Cronbach's alphas, and correlations.

**Table 6***Cronbach's Alphas, Means, Standard Deviations, and Correlations*

	Measures				
	SSI	PD	PVD	HRBLI	HRBRI
<i>M</i> ( <i>SD</i> )	5.28 (1.28)	4.37 (1.26)	4.22 (1.00)	3.40 (.90)	2.45 (.83)
$\alpha$	.92	.87	.66	.72	.79
<b>Measure</b>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
SSI		-.28**	-.20*	.35**	-.06
PD			.42**	-.51**	.44**
PVD				-.40**	.34**
HRBLI					-.40**
HRBRI					

*Note:* \* $p < .05$ ; \*\* $p < .01$ ; SSI = Shared Social Identity; PD = Perceived Disgust; PVD = Perceived Vulnerability to Disease; HRBLI = Likelihood of Engaging in Health Risk Behaviours; HRBRI = Perceived Riskiness of Engaging in Health Risk Behaviours

### Mediation analyses

Mediation analyses using PROCESS version 3.0 (Hayes, 2017) were performed to examine whether shared social identity had an indirect effect on health risk perceptions via perceived disgust. Shared social identity was entered as the independent variable (*X*), health risk perception (Model 1 = perceived vulnerability to disease; Model 2 = likelihood of engaging in health risk behaviours; Model 3 = perceived riskiness of engaging in health risk behaviours) as the dependent variable (*Y*) and finally perceived disgust as the mediator (*M*) in the models. The three mediation models were tested using 5,000 bootstrap resamples and 95% percentile bootstrap confidence intervals with age and gender entered as covariates. The total, direct, and indirect effects from the models are shown in Table 7.

**Table 7***Total, Direct, and Indirect Effects from the Mediation Analyses*

Measure	Total Effect	Direct Effect	Indirect Effect	LLCI	ULCI
PVD	<i>Coeff</i> = -.14, <i>SE</i> = .06, <i>p</i> = .027	<i>Coeff</i> = -.06, <i>SE</i> = .06, <i>p</i> = .316	<i>Coeff</i> = -.08, <i>SE</i> = .03	-.1566	-.0286
HRBLI	<i>Coeff</i> = .24, <i>SE</i> = .05, <i>p</i> < .001	<i>Coeff</i> = .15, <i>SE</i> = .05, <i>p</i> = .003	<i>Coeff</i> = .08, <i>SE</i> = .03	.0346	.1383
HRBRI	<i>Coeff</i> = -.04, <i>SE</i> = .05, <i>p</i> = .507	<i>Coeff</i> = .04, <i>SE</i> = .05, <i>p</i> = .382	<i>Coeff</i> = -.08, <i>SE</i> = .03	-.1416	-.0317

*Note:* The independent variable is shared social identity and the mediator variable is perceived disgust in all models; LLCI = Lower Level Confidence Interval; ULCI = Upper Level Confidence Interval; PVD = Perceived Vulnerability to Disease; HRBLI = Likelihood of Engaging in Health Risk Behaviours; HRBRI = Perceived Riskiness of Engaging in Health Risk Behaviours

The results mirror those of Study 1. The direct effects show that greater shared social identification was associated with greater likelihood to engage in health risk behaviours. The direct effects of perceived vulnerability to disease and perceived riskiness of engaging in health risk behaviours were not significant. Turning to the indirect effects, the results show that perceived disgust mediated the relationship between greater shared social identification and lowered health risk perception. More specifically, the reporting of lower health risk perceptions (i.e., lower perceived vulnerability to disease and perceived riskiness of engaging in health risk behaviours, and greater likelihood of engaging in health risk behaviours) was indirect and mediated via perceived disgust.

### **Discussion**

This study examined the effect of experiencing a shared social identity with other crowd members on health risk perceptions in a sample of participants who had recently attended music festivals. The findings corroborate those of Study 1 and provide further empirical evidence that experiencing a shared social identity in mass gatherings may

lower health risk perceptions via lower levels of perceived disgust. They also extend them by drawing on a sample of participants who have very recently attended a specific type of mass gathering – music festivals.

### **General Discussion**

The research reported herein examined the effect of sharing a social identity in mass gatherings on perceived disgust and health risk perceptions. The results from two studies evidenced that experiencing a shared social identity with other crowd members lowered health risk perceptions; this effect was indirect and mediated via perceived disgust. That is, participants who experienced a shared social identity reported lower health risk perceptions because they also perceived less disgust.

While previous research has focused on physical factors in relation to health risks associated with mass gatherings, recent directives and theory highlight the importance of understanding the role of psychological factors in aggravating and mitigating the risks (Hopkins & Reicher, 2016a, 2017; WHO, 2015). The current research complements and goes beyond existing research concerning mass gathering-associated health risks (e.g., Abubakar et al., 2012; Memish et al., 2012) by providing initial empirical evidence as to how social identity processes lower health risk perceptions. The research thus offers empirical evidence in support of theorisations about how health risk perceptions in mass gatherings are entwined in social identity processes (Hopkins & Reicher, 2016a, 2017).

The findings make two important contributions to the literature. First, the findings reveal that social identity processes may also result in negative health outcomes in mass gathering settings – a phenomenon that has primarily been observed in relation to unhealthy group norms in small group settings (e.g., Tarrant & Butler, 2011).

Specifically, the findings show that, similar to group members' underestimation of the risk posed by unhealthy group norms (e.g., L. F. Campbell & Stewart, 1992), experiencing a shared social identity in mass gatherings lowers health risk perceptions. Second, the findings elucidate how lowered perceived disgust underpins this negative relationship in the context of mass gatherings; this extends previous research that has shown that sharing a social identity lowers disgust responses (Reicher et al., 2016) and research that has linked disgust sensitivity to heightened health risk perceptions (Karg et al., 2018). The findings pose concerns for the management of mass gatherings; lowered disgust among crowd members could facilitate disease transmission by encouraging resource sharing (Pellerin & Edmond, 2013; Reicher et al., 2016) or other practices likely to be affected by an attenuated disgust response. If this defence mechanism against pathogens is attenuated, people may be less vigilant in situations where disease transmission is a risk, which could have serious health consequences (see Hopkins & Reicher, 2016a, 2017).

The findings highlight the relevance of considering social identity processes in the planning and management of mass gathering events. Preliminary evidence indicates that drawing on social identity processes can increase the effectiveness of health messages (e.g., anti-smoking ads targeting peer groups with which adolescents identified improved their smoking attitudes; Moran & Sussman, 2014). For example, making salient 'health aware' and 'care-taking' social identities that protect fellow crowd members' health and discourage health risk behaviours is an effective strategy. That is, health messages could encourage event attendees to consider the degree to which their behaviour may not only affect their own health but also that of their fellow crowd members with whom they identify. Furthermore, associating unhealthy behaviours with an outgroup can lead people to make healthier choices (e.g., linking alcohol

consumption to an outgroup reduced consumption among undergraduate students; Berger & Rand, 2008). For example, drug testing facilities at music festivals reduce the risks associated with recreational drugs (Hollett & Gately, 2019; Mema et al., 2018), and failure to utilise these facilities could be portrayed as non-normative behaviour unrepresentative of the typical festival-goer. Moreover, targeting social categories (and thereby social identities) representing prototypical frequenters may also prove to be an effective strategy; it has been suggested that communication that makes salient an individual's social identity as a member of a specific group motivates them to act in accordance with the group prototype (Comello, 2013; Comello & Farman, 2016).

There are several limitations to this research that also need to be highlighted. Although Study 2 addressed the limitations of Study 1 in terms of attendance recency, future research should involve field-based studies. For example, collecting data within an ongoing mass gathering event to capture attendees' experiences of sharing a social identity and perceptions of health risks may reduce memory distortions (e.g., see FAB; Ritchie et al., 2015). In addition, the current research did not examine whether the negative relationship between sharing a social identity and health risk perceptions is universal among different types of mass gatherings. Normative health-related behaviour will differ depending on the nature of the mass gathering. For example, music festivals are known for (unprotected) sex, alcohol consumption, and drug use (WHO, 2015) – these behaviours are unlikely to be endorsed at religious mass gathering events (e.g., the Magh Mela and Hajj) wherein resource sharing may present more acute risks. Future research would therefore benefit from more fine-grained examinations of differences in normative practices harmful to health between different types of mass gathering events. Moreover, only perceived disgust was considered as a mediator of the relationship between shared social identification and health risk perceptions in mass gatherings.

Future research should identify additional mechanisms that underpin the relationship between sharing a social identity and health risk perceptions and behaviours. Given that crowd members who share a social identity expect and receive social support from one another (Alnabulsi & Drury, 2014; Drury et al., 2009b; Hopkins et al., 2019; S. S. Khan et al., 2015; Pandey et al., 2014), and that this can enhance well-being (S. S. Khan et al., 2015), it is not unreasonable to assume that this relational transformation may lessen concerns about the negative consequences of health risk behaviours. For example, festival-goers may underestimate the risk of using recreational drugs as they feel safe and supported by other crowd members and expect to receive their support if something goes astray. The implications of social support for health-related perceptions and behaviours in mass gatherings are therefore contextual – it can be a cure in one context, but a curse in another (see C. Haslam et al. (2018) and Wakefield et al. (2019) for overviews of the ‘social cure’ versus ‘social curse’ paradigm).

The present research has provided empirical evidence that shared social identification may undermine health risk perceptions in mass gatherings; it has also unveiled a mechanism through which this negative relationship operates – lowered perceived disgust. These findings have important implications for understanding how social identity processes may aggravate health risk behaviours in mass gatherings. By the same token, the exact same processes can be drawn upon to mitigate health risk behaviours in mass gatherings. Finally, it is important to emphasise that the research does not intend to portray social identity processes as uniquely exacerbating health risks in mass gatherings. The health benefits associated with collective participation (Cruwys et al., 2019; S. S. Khan et al., 2015) should not be neglected. Rather, the present research should be seen as contributing to efforts to understand the nature and scope of



social identity processes in aggravating and mitigating health risks in mass gatherings  
(e.g., Hopkins & Reicher, 2016a; WHO, 2015).

## CHAPTER 6: A Systematic Scoping Review of the Literature (Study 4)

### Chapter Overview

In Chapter 4, the first empirical study of the thesis was described – a systematic review of the literature concerning the implications of social identification for health risk perceptions and behaviours in *mass gatherings*. In this chapter, a systematic scoping review of the literature on the implications of social identity processes for health risk perceptions and behaviours in *non-mass gathering* settings is presented. What follows is a full description of the study, including a definition of scoping reviews.

### Introduction

Study 1 (a systematic review) revealed that little evidence exists of the theorised negative social identity-health risk relationship in mass gatherings. Study 2 (an experimental vignette study) and 3 (a cross-sectional survey) were the first published empirical studies to directly examine and provide evidence for this relationship in mass gathering contexts. Furthermore, although several reviews (systematic or otherwise) have been published concerning the positive relationship between social identification and health in non-mass gathering contexts (e.g., Postmes et al., 2019; Steffens et al., 2017, 2019), there is an absence of consolidated and systematically reviewed literature regarding the negative relationship – particularly relating to health risk perceptions and behaviours. Searching the Cochrane database, all available databases via EBSCO, and Google Scholar using a set of keywords revolving around systematic reviews, social identification, and health risk perceptions and behaviours did not retrieve any relevant reviews. Conducting the same search, but focused upon specific health risk outcomes (smoking, alcohol, and drugs), yielded only a few results. Based on these results, there are systematic reviews on the relationship between social identification and specific health risk perceptions and behaviours, such as smoking (e.g., see Tombor et al., 2015).

There are also systematic reviews that have not focused on social identification but concluded that social identity processes play an important role in specific health risk outcomes (e.g., athletes' alcohol consumption; see Sønderslund et al., 2014; Zhou & Heim, 2014).

There is a paucity in consolidated systematic reviews of the negative relationship between social identification and health risk outcomes and the, so far, limited evidence of this negative relationship in mass gatherings. The evidence is currently limited to Hopkins and Reicher's (2016a, 2016b, 2017) *theoretical* accounts and, in terms of *empirical* evidence, to Study 2 and 3 of the thesis and disgust as an underlying process. Further theoretical and exploratory work is therefore needed in this area. Synthesising existing evidence of the negative implications of social identification for health risk perceptions and behaviours in non-mass gathering settings can be useful in this regard. That is, it could enable further theorisation and identification of additional social identity processes that may implicate or underpin health risk perceptions and behaviours in mass gathering settings. Reviewing literature from diverse non-mass gathering social contexts can also provide a greater understanding of how social identity processes may operate in different types of mass gathering contexts. Moreover, rather than solely relying on theoretical accounts, it can provide a greater empirical basis to inform the design of future fieldwork and health interventions aimed at mitigating mass gathering-associated health risks. A systematic scoping review of the literature (see the 'Design' section below for a detailed description of this type of review) on the negative implications of social identity processes for health risk perceptions and behaviours in non-mass gathering settings was therefore carried out.

Examining the spectrum of health risk outcomes (i.e., health risk perceptions and behaviours at large), rather than specific health risk outcomes, was thought to provide a

more holistic understanding of the implications of social identity processes for health risk outcomes. This approach not only allows for identification of what and how social identity processes implicate health risk outcomes (and what health risk outcomes are implicated by social identity processes), but also for similarities and differences to be identified and understood between different health risk outcomes and social identity processes. For example, do people engage in *X* health risk behaviour because of *X* underlying social identity process and is this also the case for *Y* health risk behaviours and *Y* social identity process? If so, why? If not, why not? This, in turn, provides a deeper understanding of what and how social identity processes operate in terms of health risk outcomes and lays the foundation for theorising – beyond Hopkins and Reicher’s (2016a, 2016b, 2017) theoretical and empirical overviews and Study 1 (a systematic review; see Chapter 4) – about what and how identified social identity processes may also implicate health risk outcomes in mass gatherings. As Siddaway et al. (2019) expressed, “new ideas and conceptualisations might emerge from the process of reviewing and integrating the existing evidence” (p. 750). On the whole, this study was carried out because it has the potential to identify social identity processes that may implicate health risk outcomes in mass gatherings that have been overlooked or not considered in existing theoretical accounts and research. Findings from this study can subsequently inform future research, be it deductive (e.g., testing the influence of an identified social identity process on a health risk outcome in mass gatherings) or inductive (e.g., further qualitatively exploring social identity processes and health risks in mass gatherings).

### **Research Questions and Objectives**

The present study sought to answer the following broad research questions, for which the employment of a scoping review method was deemed appropriate:

1) What are the negative implications of social identity processes for health risk perceptions and behaviours?

2) How can social identity processes identified to be negatively implicated in health risk perceptions and behaviours in non-mass gathering settings generalise to mass gathering settings?

The two specific objectives of this study were therefore to: a) provide a comprehensive overview of the research on the negative implications of social identity processes for health risk perceptions and behaviours in non-mass gathering settings; and b) consider how reviewed social identity processes may generalise to mass gathering settings.

## **Method**

### **Design**

A systematic scoping review, informed by the method outlined by Arksey and O'Malley (2005), and following the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) reporting guidelines (Tricco et al., 2018), was conducted. The review was registered with PROSPERO (ID: CRD42019120507).

Systematic reviews have been widely used for several decades and it is not until recently a similarly rigorous and transparent method of evidence synthesis has started to gain popularity, namely scoping reviews (Munn et al., 2018). Although scoping reviews lack a universal definition and definitive method, they are similar to systematic reviews in that a structured process is followed and reported in a transparent manner. They are undertaken for a different purpose, and some key methodological features differentiate the two types of reviews (Munn et al., 2018; Peters et al., 2015; Pham et al., 2014).

Systematic reviews seek to answer precise and clearly defined questions and typically

specify study designs (e.g., randomised controlled trials) to be included in the review in advance (e.g., “Does this intervention improve specified outcomes when compared with another intervention in this population?”). Scoping reviews, however, tend to address broader topics and research questions, and often include a range of study designs (e.g., “What is known about this concept?”). While systematic reviews also typically answer research questions through a smaller set of quality appraised studies, scoping reviews are less likely to appraise the quality of included studies (due to their heterogeneity) and include extensive data synthesis. However, this is not prescriptive – reviewers may choose to conduct quality appraisal and elaborate data synthesis of included studies in scoping reviews (Arksey & O’Malley, 2005; Tricco et al., 2018).

On the whole, scoping reviews are often used to map existing evidence in a field of interest in terms of its nature (e.g., characteristics) and volume (e.g., range and extent). They may serve to determine the feasibility of conducting a systematic review, summarise and disseminate research findings, identify gaps in the literature, and provide directions for future research. When a body of literature has not been comprehensively reviewed and/or is large, complex or heterogeneous in methods or disciplines that could render it unsuitable for a systematic review, scoping reviews can be particularly useful to conduct – as is the case in terms of the present study (Peters et al., 2015; Tricco et al., 2018). Summarising the discussed elements of scoping reviews, Colquhoun et al. (2014, pp. 1292-1294) proposed the following definition: “A scoping review or scoping study is a form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesising existing knowledge.” It is the mapping of key concepts that is of particular interest in this study.

What distinguishes this review from a systematic review is that it addressed broader rather than highly specific (narrow) research questions to allow for the capturing and mapping of a literature base from multiple disciplines and methodologies. A systematic scoping review was therefore selected given the potential breadth of the literature to be examined. This review is nonetheless a *systematic* scoping review because it used a systematic search strategy, incorporated quality appraisal in the review process, and provided an elaborate data synthesis of available evidence – this is more in line with systematic reviews. It should be noted that, henceforth, ‘reviewers’ refers to the author of this doctoral thesis (Daniella Hult Khazaie; DHK) and the primary supervisor of the doctoral research project (Sammyh Khan; SK).

### **Search Strategy**

Input from two experts in systematic reviews within the Research Institute for Primary Care and Health Sciences at Keele University (UK) and scoping searches informed the final search strategy. Additionally, the search strategy was informed by published systematic reviews, discussion between the reviewers, examination of MeSH terms, and relevant literature previously known to DHK. The following electronic databases were subsequently searched from their inception to June 8, 2018, via the search platform EBSCO: MEDLINE, CINAHL, PsycARTICLES, and PsycINFO. These databases were selected as they were expected to contain relevant studies. With reference to previous literature and reviews, a combination of subject headings (e.g., MeSH terms) and keywords were used to reflect the following key concepts: social identification and health risk perceptions and behaviours. The Boolean operators ‘AND’ and ‘OR’ were used to combine concepts and keywords and truncation was used to retrieve variations of keywords through searching of titles and abstracts. Not all databases indexed entries using subject headings - the search was adapted for the individual databases, as

required. The search strategy (developed for MEDLINE) reflects the search strategy used in Study 1 of the thesis, bar the exclusion of keywords relating to the mass gathering concept:

((MH Social Identification) OR shar\* identi\* OR shar\* social identi\* OR social group\* OR social identi\* OR collective identi\* OR bonding identi\* OR group identi\* OR peer identi\* OR collectivity OR social categor\* OR self categor\*) AND ((MH "Risk-Taking") OR (MH "Health Behavior") OR perceived risk\* OR risk perception\* OR risk\* apprais\* OR perce\* vulnerability OR perce\* susceptibility OR risk\* behavio#r OR risk-taking)

The ‘references’ sections of articles retrieved for full-text screening were manually scanned to identify any additional studies eligible for inclusion that were not retrieved through database searching. Searches were limited to the English language.

### **Eligibility Criteria**

The review sought to identify published studies using any methodology (quantitative, qualitative or mixed) that reported primary data (i.e., original research) relating to the implications of social identification for health risk behaviours and/or perceptions (i.e., health risk outcomes), sampling participants of any age and gender. Identical to Study 1 (a systematic review presented in Chapter 4), the construct ‘social identification’ was interpreted broadly in this study to capture the variation within the literature (see Chapter 2). Both unidimensional and multidimensional approaches to conceptualising and operationalising social identification were therefore considered. However, studies that measured social identification were required to have administered measures that involved at least one aspect focused upon self-categorisation as a member of a specific group (i.e., social category) and strength of identification with that social category.



Health risk outcomes were kept deliberately broad to capture a wide spectrum of health risk outcomes. Studies were not excluded by publication date, but if they were not accessible via inter-library loan, they were not included. A full overview of the inclusion and exclusion criteria is presented in Table 8.

**Table 8**

*Inclusion and Exclusion Criteria*

Inclusion criteria	Exclusion criteria
English language paper. Primary, original data derived from any methodology (quantitative, qualitative or mixed). Peer-reviewed journal article.	Not an English language paper. Not primary, original data (e.g., systematic review, review article or research agenda). Not a peer-reviewed article (e.g., books, book chapters, dissertations, theses or conference papers).
Non-mass gathering setting. Focuses on self-categorisation/strength of social identification.	Mass gathering setting. Only focuses on objective indicators of social identification (e.g., frequency of contact with a group).
Results elucidate how social identification affects health risk outcomes.	Results do not elucidate how social identification affects health risk outcomes.
Health risk outcome constituting attitudes/perceptions/behaviours concerning phenomena that pose a (physical) risk to health (e.g., substance misuse, driving under the influence, and eating unhealthy food).	Health risk outcome constituting mental health and mood problems (e.g., depression, suicidal ideation), antisocial behaviour (e.g., aggression, shoplifting), teen pregnancy, current health status or wellbeing, body mass index, eating disorders, health-protective behaviour (e.g., fruit intake, exercise, and quitting smoking).
Subjective reports (e.g., self-reported engagement in risk behaviour)/researcher observations.	Objective reports (e.g., parents' perceptions of child's risk behaviour).

**Study Selection**

Search results were imported into the reference management software Mendeley ([www.mendeley.com](http://www.mendeley.com)) for initial removal of duplicates. This file was then imported into the online screening tool for systematic reviews Rayyan ([www.rayyan.qcri.org](http://www.rayyan.qcri.org)). Both

reviewers independently screened titles and abstracts. The full texts of the articles were subsequently retrieved and assessed for inclusion in the review. Any disagreements were resolved through discussion.

### **Data Extraction and Quality Appraisal**

A bespoke data extraction form was created and used to extract data relating to objectives, samples, methods, assessed variables, and main findings significant to the review's objective. This data extraction form was pilot tested using a random selection of five studies by DHK before its use in the review. Although not necessary for scoping reviews (Arksey & O'Malley, 2005), quality appraisal of the included studies was carried out in conjunction with data extraction using the Quality Assessment Tool for Mixed Methods Systematic Reviews (QATSDD; Sirriyeh et al., 2012). This tool has been described in greater detail in Chapter 4; however, in brief, included studies were assigned quality ratings of 'High', 'Moderate', and 'Low' based on 14 criteria. DHK independently conducted data extraction and quality appraisal. Following the Institute for Health and Clinical Excellence (NICE) (2012) guidelines, DHK conducted the quality appraisal of all included studies, while SK conducted the quality appraisal of a random selection of more than 10% of studies. A random selection of 10 studies (11%) was therefore assessed by SK and compared to DHK's quality appraisals to identify discrepancies. Disagreements at any stage were resolved through discussion.

### **Data Synthesis**

A narrative synthesis technique was employed to highlight main themes from the data drawing on thematic analysis principles using an inductive approach to identify main, recurrent, and most important themes across studies. Thematic analysis enables organising and encapsulating the findings from large, diverse bodies of research, as in the present review (Popay et al., 2006). Moreover, the synthesis technique was

primarily based on the guidelines for narrative synthesis outlined by Popay et al. (2006) and Siddaway et al. (2019) to reduce bias and ensure a systematic approach. The synthesis technique entailed analysing relationships within and between included studies and an overall appraisal of the quality of the evidence. More specifically, the quantitative outcomes for each quantitative study were first narratively summarised to determine the relationship between social identification and health risk perceptions and behaviours. The thematic analysis, guided by the principles outlined by Braun and Clarke (2006), was subsequently carried out of the quantitative and qualitative studies to further examine the relationship between social identification and health risk perceptions and behaviours.

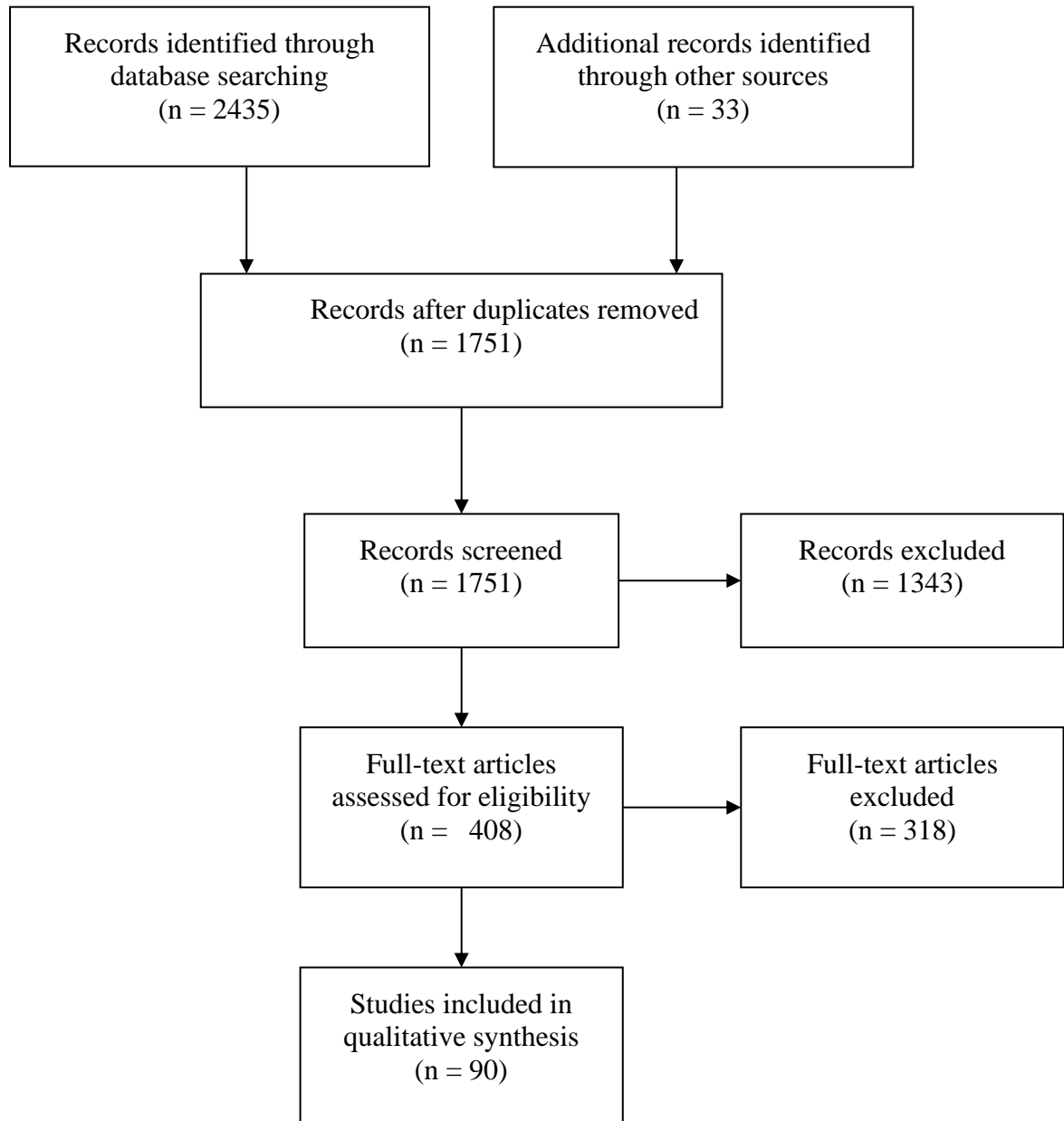
## **Results**

### **Search Results**

The initial database search retrieved 2435 records – a total of 1718 remained after removal of duplicates. An additional 33 records were identified from other sources (i.e., hand-searching, and articles known to DHK). Based on the inclusion/exclusion criteria, 1343 records were removed after title and abstract screening and a further 318 were excluded after full-text screening. The screening process resulted in the inclusion of a total of 90 articles in this review. See Figure 2 for an overview of the selection process. Appendix K presents the references for all included studies.

**Figure 2**

*PRISMA Flow Diagram of the Selection Process*



## **Overview of Included Articles**

Of the 90 articles included in the review, 78 (87%) described studies employing a quantitative design, 9 (10%) a qualitative design, and 3 (3%) mixed methods. The articles were published between 1988 and 2019, suggesting that the relationship between social identification and health risks has been a focus of research for more than three decades. It should be noted that the article from 2019 was first published online on March 15, 2018 and was therefore retrieved through the database search.

The 90 articles appeared in 69 journals, with only eight articles (9%) appearing in social psychology journals with the remaining 82 articles (91%) appearing in other types of journals. Common journal categories in which articles appeared centred around health psychology, drugs and alcohol/addiction, adolescence, and AIDS. A list of journals that published more than one article included in the review is shown in Table 9.

Remarkably, no social psychology journal is included in Table 9. Moreover, only 34 articles (38%) made explicit reference to social identity theory/self-categorisation theory in explaining the theoretical framework motivating or underpinning the research. Thirty-four (38%) articles did not make an explicit reference to a theoretical framework motivating or underpinning the research; it was common within these articles to simply refer to constructs of identity (e.g., cultural, social, and ethnic identity). That is, the construct 'identity' was often explained/defined, but the theoretical framework the construct draws on was left unmentioned. Example theoretical frameworks explicitly stated to motivate or underpin the research presented in the remaining 22 articles (24%) include social learning theory (Bandura, 1977), communication theory of identity (Hecht, 1993), social cognitive theory (Bandura, 1989), and orthogonal cultural identification theory (Oetting & Beauvais, 1991).

**Table 9***List of Journals with More than One Article Included in the Review*

Journal Name	N	Journal Name	N
Accident Analysis and Prevention	2	Journal of Drug Education	4
Addictive Behaviors	3	Journal of Studies on Drugs and Alcohol	2
AIDS and Behavior	3	Psychological Reports	2
AIDS Education and Prevention	3	Psychology and Health	2
Health Psychology	3	Psychology of Addictive Behaviors	2
Journal of Abnormal Psychology	3	Substance Use and Misuse	4

The studies presented within the articles varied widely on several characteristics, including country, age range, demographic profile (e.g., ethnicity, socioeconomic status, and education), sampling method, and study settings. The majority of included studies were conducted in the US ( $n = 61$ ), with studies also being conducted in the UK ( $n = 12$ ), Australia ( $n = 10$ ), Canada ( $n = 1$ ), South Africa ( $n = 1$ ), Denmark ( $n = 1$ ), Mexico ( $n = 1$ ), China ( $n = 1$ ), Australia and US ( $n = 1$ ), and US and Canada ( $n = 1$ ). Quantitative study designs included cross-sectional and longitudinal surveys and experiments. Qualitative studies tended to use interviews and focus groups to collect data (with two exceptions: one study used an open-ended survey and one study used direct observations). Mixed methods studies used focus groups and cross-sectional or longitudinal surveys to collect data. Cross-sectional surveys ( $N = 54$ ) were the most used data collection tools. For a substantial number of studies, the implications of social identity processes for health risk perceptions and behaviours only formed a small part – the primary focus and objectives were concerned with other phenomena.

## Quality Appraisal

Quality ratings for individual studies are presented in Appendix L. Fifteen studies were categorised as ‘Low’ quality (17%), 67 as ‘Moderate’ (74%), and eight as ‘High’ (9%). Research questions, objectives, study design, study settings, and sampling descriptions and methods were mostly well outlined and appropriate in the included studies and received positive appraisal. The most common biases among studies pertained to failure to report considerations of sample size and/or effect sizes in terms of analysis. For example, only one of the qualitative studies (Tunncliff et al., 2011) received a full quality appraisal score for providing an explicit statement concerning data saturation. By contrast, all other qualitative and mixed methods studies received a null score. Similarly, only eight quantitative studies received a full score for excellent reporting of sample size considerations in terms of analysis (Chng & Geliga-Vargas, 2000; Elliott, 2010; McGhie et al., 2012; Pugh & Bry, 2007; Scott-Parker et al., 2009; Shehadeh & McCoy, 2014; Tunncliff et al., 2011; J. J. Walker et al., 2015).

Several quantitative longitudinal studies reported high attrition rates and the majority of these did not appropriately address the issue; there was a lack of information on what type of participants dropped out and why, and what subsequent adjustments were made for the statistical analyses. Justifications for selected analytical methods were given positive appraisal in the majority of quantitative and mixed methods studies but was very poorly, or not at all, explained in six of the qualitative studies (e.g., Lennon et al., 2005; Phillips et al., 2007). Evidence of rigorous development and statistical assessment of reliability and validity of measurement tools, particularly for health risk outcomes, was lacking across most quantitative studies. Similarly, there was a lack of assessment of the reliability of the analytical process across qualitative studies. User involvement in the study design was a rarity – a few studies reported conducting pilot studies before the

main study (e.g., Livingstone et al., 2011; Sessa, 2007; Tarrant & Butler, 2011) but seldom consulted users or stakeholders to improve study design.

Returning to the 15 studies that were categorised as low quality, they are as follows: Hopmeyer and Medovoy (2017), Love et al. (2006), Corneille and Belgrave (2007), Govender et al. (2015), McLeod et al. (2008), Beaupre et al. (2015), Stapleton et al. (2008), Lennon et al. (2005), Wu et al. (2015), Miller (2008), Wagner et al. (2002), James et al. (2002), Banwell and Young (1993), Neighbors et al. (2013), and Loersch and Bartholow (2011). Given that this is a systematic *scoping* review involving a narrative synthesis of the findings rather than a traditional systematic review with a quantitative synthesis, these low quality studies have not been excluded from the synthesis. Scoping reviews are primarily concerned with mapping the existing literature and what is currently known – conducting qualitative appraisal of the evidence is not necessary or common in this type of review but it can serve to further highlight and map the strength of the evidence (Arksey & O'Malley, 2005; Hannes, 2011).

Whether low quality studies should be excluded from the synthesis has been a topic of debate, particularly if the synthesis is qualitative in nature (Carroll et al., 2012; Soilmezi & Linceviciute, 2018). Some suggest that excluding studies based on low quality can lead to selection bias and important insights being disregarded and may limit the generalisability of the review (e.g., Carroll & Booth, 2015; Hannes, 2011; Stone et al., 2019). Many reviewers therefore choose not to exclude low quality studies (Noyes et al., 2008). To illustrate a potential caveat associated with the employment of quality assessment tools, one of the articles assigned a low quality score (Loersch & Bartholow, 2011) comprises three robust experiments. However, the authors did not report all information sought in the quality assessment tool – presumably because of factors such as editor suggestions and the strict format and word limit of the publishing



journal. Therefore, a low score may not necessarily mean that a study is of poor quality, it is possible that some aspects were simply not reported and thus cannot be quality appraised. It has been argued that reviewers should use quality appraisal tools for exploration and judge the low quality studies' contribution to the synthesis based on their credibility and relevance to the review question rather than solely methodological aspects (e.g., Atkins et al., 2008; Dixon-Woods et al., 2007). Exclusion of studies is therefore at the reviewers' discretion This pragmatic approach was adopted in the present review and no study was excluded based on its quality.

Nonetheless, where low quality studies are the only studies that demonstrate a specific finding, or where a low quality study has been given as a sole example, a cautionary note has been included in the reporting of the results and in the discussion section (i.e., that the quality of the study has been categorised as low). Regardless, the low quality studies do not compromise the quality or integrity of the themes as they are not accumulated within a single or only a few themes. Rather, the low quality studies are spread out within all main themes. Furthermore, each theme still contains moderate to high quality studies.

## **Themes**

Four main themes with four sub-themes were identified from the reviewed studies: 1) Peer crowd identification as a health-impairing and health-protective factor (sub-themes: Conformist and non-mainstream identities and Sports-related identities); 2) Minority group identification as a health-impairing and health-protective factor (sub-themes: Ethnic, racial, and cultural identities and Non-heterosexual identities); 3) Fitting in: Social pressure and affirming a distinct social identity; and 4) Theoretically discordant findings. The included studies are organised and summarised under the different themes based on similarities in their research focus. Not all included studies'

findings are referenced or described in detail, but a selection of studies are highlighted for illustrative purposes in this results section. It should be emphasised that the themes are employed for a comprehensible summative presentation of the results and do not suggest that the findings presented within the themes represent mutually exclusive phenomena. Furthermore, the themes correspond to the authors of the included studies own conceptualisations of social identity processes. Although their accounts of these may not necessarily draw on the social identity approach, they can arguably be explained by it. The studies and their findings will therefore be interpreted from the lens of the social identity approach in the discussion section. A table summarising the included studies can be found in Appendix L, which also includes quality ratings.

### **Descriptions of the Themes**

#### ***Peer Crowd Identification as a Health-Impairing and Health-Protective Factor***

The first theme concerned peer crowd identification and its health-related corollaries. It should be highlighted that, conceptually distinct from a crowd at a mass gathering event, peer crowds are macro-level subcultures, or collectives, that are not necessarily situated in a mass gathering setting. Adolescents/young adults cognitively identifying with such a subcultural category are considered a peer crowd (Jordan et al., 2019). Studies in Europe and North America have consistently identified analogous peer crowds, including deviant crowds (e.g., ‘burnouts’), high-status crowds (e.g., ‘populars’), sports-oriented crowds (e.g., ‘jocks’), academically oriented crowds (e.g., ‘brains’), and non-distinctive crowds (e.g., ‘normals’) (Sussman et al., 2007).

#### ***‘Conformist’ and ‘Non-Mainstream Identities’***

A multitude of studies demonstrated how identification with different peer crowds could be both protective and detrimental for health; identification with certain peer crowds was associated with substantially higher endorsement of health risk behaviours

or lowered health risk perceptions than others. Identification with peer crowds that, across studies, typically exhibited a health-protective influence primarily pertained to ‘brains’, ‘mainstream’, ‘nerds’, and ‘scholastics’. These peer crowds reported more negative attitudes towards and less engagement in risk behaviours than other peer crowds (e.g., Barber et al., 2001; Hopmeyer & Medovoy, 2017; Jordan et al., 2019; La Greca et al., 2001; Sessa, 2007; Stapleton et al., 2008; Verkooijen et al., 2007). A process implicated in this health-protective relationship pertained to group norms. For instance, research by Stapleton et al. (2008) showed that identification with ‘brains’ was negatively associated with beliefs that UV tanning was normative (although, it should be noted that it was a low quality study). Similarly, research by Verkooijen et al. (2007) demonstrated that identification with a range of different peer crowds (e.g., ‘computer nerd group’) was negatively associated with smoking and drug use - perceived group norm mediated this relationship.

Turning to the detrimental effects, identification with peer crowds such as ‘burnouts’, ‘nonconformists’, ‘alternatives’, ‘dirts’, ‘hip hop’, and ‘punks’ was consistently associated with one or more risk behaviours (e.g., alcohol consumption, sexual risk-taking, smoking, and needle sharing) across several studies (e.g., Fuqua et al., 2012; Hopmeyer & Medovoy, 2017; Jordan et al., 2019; Kipke et al., 1997; La Greca et al., 2001; Lee et al., 2014; Lisha et al., 2016; Mosbach & Leventhal, 1988; Sessa, 2007; Sussman et al., 1990, 2004; Verkooijen et al., 2007; M. W. Walker et al., 2018). Some peer crowds also reported greater difficulty resisting social pressure to use drugs (e.g., ‘punks’) than others (e.g., ‘athletes’; Kipke et al., 1997). Verkooijen et al. (2007) found that perceived group norms mediated the relationship between peer crowd identification and substance use. Furthermore, identification with multiple groups for which substance use was normative increased norm-consistent substance use, whereas identification with

multiple groups for which substance use was non-normative reduced substance use. Relatedly, identification with other substance users and perceived norms were associated with more substance use in an adult sample, although from a study categorised as low quality (Neighbors et al., 2013).

Longitudinal research revealed that smoking norms among peer crowds negatively impacted on young adults' smoking status and attitudes, particularly among those highly identified with their peer crowds (Schofield et al., 2001, 2003). Identification with different peer crowds was also sometimes a better predictor of future smoking than a range of psychosocial variables (e.g., family conflict, stress, and self-esteem; Sussman et al., 1994). However, peer crowd identification is not exclusively health-impairing (or health-protective); for example, 'populars' were more likely to endorse unhealthy UV tanning behaviours (Stapleton et al., 2008; a low quality study) but were at less risk for substance use and smoking (Jordan et al., 2019; M. W. Walker et al., 2018). Similarly, identification with family and school groups predicted a lower risk of substance use, whereas identification with peer groups predicted a higher risk of substance use among adolescents. An overall decrease in substance use was observed as adolescents' number of identifications with social groups increased. However, adolescents who highly identified with a single group displayed greater engagement with substance use. The authors suggested that this was because they were likely to be influenced by any unhealthy norms specific to the single (peer) group with which they identified and were not protected by other groups' (e.g., family) healthy norms (K. Miller et al., 2016; see also Sani et al., 2015).

Overall, some social identities are health-protective, whereas others are health-impairing. Still, there appears to be an advantage of belonging to a greater number of groups, given that these groups do not adhere to unhealthy norms. As shown across

studies, social groups that can be thought of as more ‘conformist’ (i.e., groups that conform to standards of society and that do not wish to stand out, such as ‘nerds’ and ‘brains’; Moran et al., 2017) demonstrate lower risk for health-impairing behaviours. By contrast, more ‘non-mainstream’ social groups (i.e., groups that highly identify with music genres and with a sense of being different from mainstream youth, such as ‘hip hop’ and ‘alternatives’; Moran et al., 2017) are at increased risk for a range of health-impairing behaviours. These findings strongly indicate that these social groups, and their respective norms, have distinct health-related behavioural associations.

### *Sports-Related Identities*

A large body of the literature on peer crowd identification explicitly focused on sports-related identities (e.g., jock identity, athlete identity, and sports group identification) and yielded mixed results. Notably, these studies tended to aggregate participants engaged with different types of sports in their analyses (e.g., Grossbard et al., 2009; Zhou et al., 2014) and only occasionally separated between individual sports players and team sports players (e.g., Zhou et al., 2015). The aggregation of different types of sports players precludes a more nuanced account of differences between individual sports identities and associated health-related behaviours. Nevertheless, the majority of the studies examined jock identification which was associated with a range of health risk behaviours, including general risk-taking, alcohol consumption, drug use, and sexual risk-taking (e.g., Barber et al., 2001; La Greca et al., 2001; K. E. Miller et al., 2003, 2005; Sessa, 2007). However, an exception was reported by Mosbach and Leventhal (1988), whereby jock identification was associated with lower alcohol consumption and smoking. Despite the health risks associated with jock identification, it can also serve as an attenuator in an unhealthy relationship, such as the relationship between conforming to masculinity norms and energy drink consumption (Wimer &

Levant, 2013). On the other hand, jock identification was positively associated with energy drink consumption in another (low quality) study – a relationship mediated by masculinity norms and general risk-taking behaviour (K. E. Miller, 2008).

The second most prominent sports-related identification in the included literature was athlete identification, which similar to jock identification was associated with both health-impairing and health-protective behaviours. Athlete identification moderated alcohol consumption; team sports players with a strong sense of athlete identification reported greater alcohol consumption whereas alcohol consumption decreased as athlete identification increased among individual sports players (Zhou et al., 2015). In addition, athlete identification moderated the relationship between perceived drinking norms among athletes and alcohol consumption; among high identifiers, perceived drinking norms had a bi-directional association with alcohol consumption (Grossbard et al., 2009). The authors suggested that highly identified athletes modified their behaviours to mirror other athlete's risk-taking behaviour to validate and uphold their group membership. However, another (low quality) study showed that athlete identification negatively predicted drug-related risk-taking behaviours (Hopmeyer & Medovoy, 2017), while alcohol consumption was perceived as being normative for the athlete identity, drug use was not.

In terms of other sports-related identities, one study found that team cohesion but not sporting identification predicted alcohol consumption (Zhou et al., 2014). Another study found that positive reinforcement drinking motives (i.e., alcohol consumption as a sports-related reward) mediated the positive relationship between sports group identification and alcohol consumption (Zhou et al., 2016). Moreover, alcohol consumption reported at baseline was positively associated with greater sports group

identification at follow-up, indicating that alcohol consumption was an identity-defining behaviour (Zhou et al., 2016).

Taken together, the studies that focus upon sports-related identities, like other peer crowd identities, present contrasting findings concerning health – sports identities are both protective and detrimental to health. Team sports, as opposed to individual sports, appear to be particularly associated with unhealthy drinking norms, potentially because players celebrate their sports achievements together as a team and, in many cultures, celebration tends to involve alcohol. Feasibly, such norms may serve to strengthen the bond between team players (i.e., a sense of shared identity).

### ***Minority Group Identification as a Health-Impairing and Health-Protective Factor***

The second theme concerned social identification with minority – and often stigmatised – social groups. More specifically, ethnic, racial, and cultural identification and non-heterosexual identification was examined in a large body of the included literature.

Identification with these social groups was associated with both protective and impairing effects on health risk perceptions and behaviours.

### ***Ethnic, Racial, and Cultural Identities***

The vast majority of studies focusing on ethnic, racial, and cultural identification concerned Blacks, Hispanics, and American Indians/American Natives residing in the United States wherein they are minority groups. Ethnic or racial identification as American Native/Indian, Hispanic, Asian American, Black or African American was found to be a protective factor against a range of health risk behaviours in several studies (e.g., Caldwell et al., 2004; Chae et al., 2008; Corneille & Belgrave, 2007; Espinosa-Hernández & Lefkowitz, 2009; Holley et al., 2006; Love et al., 2006; Nasim et al., 2007; Pugh & Bry, 2007; Schwartz et al., 2011; Stock et al., 2013; Wagner et al.,

2002; J. J. Walker et al., 2015). Furthermore, ethnic and racial identification was positively associated with knowledge of risk factors for non-communicable diseases among Blacks and Hispanics (Brezo et al., 2006; Hovick & Holt, 2016). By contrast, participants reporting low levels of ethnic, racial or cultural identification were at higher risk of alcohol consumption or disorder, drug use, and risky sexual behaviour (Chae et al., 2008; Shehadeh & McCoy, 2014; Stock et al., 2011, 2013). However, low identification may not necessarily be detrimental; it has also been found that lower ethnic identification among Black and Hispanic participants is associated with higher levels of positive change in sexual risk behaviours (Shehadeh et al., 2012).

Turning to the health-impairing effects, ethnic identification was positively related to drug use and sexual risk-taking among Hispanics, and American identification was positively related to hazardous alcohol use among East Asians (Schwartz et al., 2011). A strong sense of cultural identification among Asian Americans, African Americans, Native Americans, Hispanics, and mixed-race (analysed as an aggregate) predicted heavy drug use (James et al., 2000), but it should be noted that this study was categorised as low quality. Based on the content from focus groups with American Indians/Alaska Natives (AI/AN), Brown et al. (2016) suggested that AI/AN cultural identification was a contributing factor in the use of alcohol and drugs. The AI/AN community and/or attachment to AI/AN identity could lead individuals to engage in risky behaviours or make it more difficult for them to abstain as these behaviours are entrenched in the community due to the historical trauma and deprivation experienced by the ethnic group. Furthermore, African Americans, American Indians, and low-income groups associated health-protective behaviours (e.g., exercise and a healthy diet) with outgroups (i.e., white and middle-class) and health-impairing behaviours (e.g., smoking and an unhealthy diet) with the ingroup, especially when their social



identity was made salient (Oyserman et al., 2007). More specifically, ethnic minorities who viewed messages about healthy behaviours emanating from White middle-class sources perceived these behaviours as non-normative for their group. The authors suggested that when individuals perceive a behaviour as congruent with their social identity, they are motivated to endorse the behaviour because it is identity affirming, regardless if it is detrimental to their health. Endorsing unhealthy behaviours may positively distinguish their minority ingroup from the majority outgroup.

Multiple studies also found no significant relationship between ethnic, racial or cultural minority group identification and health risk perceptions or behaviours. One study did not find any effects of American Indian cultural identification on risk behaviours pertaining to substance use (Baldwin et al., 2011). Similarly, Korean American identification was unrelated to alcohol, drug, and cigarette use (Beaupre et al., 2015); notably, though, this study was categorised as a low quality, and the identity may not be as stigmatised or deprived as other ethnic minority groups. Furthermore, a few studies focused on cultural and ethnic identification and risk perceptions in relation to non-communicable diseases without uncovering any significant associations. First, ethnic identification was unrelated to cancer risk perceptions among Blacks and Hispanics (Hovick & Holt, 2016). Second, there was no relationship between American Indian cultural identification (Simonds et al., 2017) and African American ethnic identification and perceived susceptibility to diabetes (Brezo et al., 2006), despite a high prevalence of diabetes and diabetes morbidity within these ethnic groups.

#### *Non-heterosexual Identities*

Multiple studies examined the relationship between minority sexual identification (i.e., non-heterosexual identification), such as ‘gay’ identification and ‘barebacker’ identification, and health risk perceptions and behaviours. These identifications were

found to be both health-impairing and health-protective in these studies. Concerning the health-impairing relationship, 'barebacker' identification was not associated with condom use norms, but it was associated with alcohol consumption and unprotected sex incidents (Reisner et al., 2009). It was also associated with higher use of drugs and perceived peer norms for engaging in unprotected sex (Parsons & Bimbi, 2007). Identifying with 'bears' and 'muscle boys' was linked to a range of health risk behaviours, such as sexual risk-taking, smoking, steroid use, and substance use (Willoughby et al., 2008). The perceived risk of engaging in HIV-risk behaviours was underestimated when it involved ingroup behaviours compared to outgroup behaviours, in both homosexual and intravenous drug-user groups (L. F. Campbell & Stewart, 1992).

Greater sexual pride predicted less sexual risk-taking among Black and Latino men-who-have-sex-with-men, but this relationship was moderated by ethnic identity (specifically ethnic exploration, i.e., active involvement in one's ethnic group).

Whereas the relationship was strengthened by greater ethnic exploration amongst Latinos, it was weakened by greater ethnic exploration among Blacks (Corsbie-Massay et al., 2017). The authors suggested that this may be because the Latino community is more tolerant of homosexuality than the Black community; ethnic exploration among Blacks may lead them to discover more negative attitudes toward homosexuality within their communities, reducing the protective function of sexual pride. Moreover, Latinos may have a communal advantage compared to Blacks as Latinos make up a substantial part of the population and is the second-largest gay population in the area where the research was situated and conducted. Exploration of ethnic identification among Latinos may therefore not have to be independent of gay identification.

Nevertheless, some studies reported that gay identification was linked to substance use, sexual risk-taking, and difficulty resisting pressure to engage in unprotected sex (e.g., Chae & Yoshikawa, 2008; Kipke et al., 1997). By contrast, other studies indicated that identification with the gay community or being gay also served as a protective factor against sexual risk-taking (e.g., Card et al., 2017; Chng & Geliga-Vargas, 2000) and that identifying with ‘twinks’ and ‘professionals’ was associated with a lower risk of sexual risk-taking and substance use (Willoughby et al., 2008). Other studies found no connection between gay identification and risk behaviours; for example, involvement with the gay community but not gay identification was associated with sexual risk behaviour in one study (Flores et al., 2009). Moreover, neither identification with other members of a HIV prevention trial nor sexual risk-taking norms were predictive of risky sexual behaviour or intentions to engage in these with other members among gay men (Mimiaga et al., 2008).

### ***Fitting In: Social Pressure and Affirming a Distinct Social Identity***

Social pressure and the desire to affirm a distinct social identity were identified as motivating factors in health-risk engagement. Studies under this theme revolved around adoption of health risk behaviours to ‘fit in’ with a social group. When a university student identity is made salient, students report weaker intentions to drink safely (Tarrant & Butler, 2011). This effect is likely because alcohol consumption is considered to be normative among students and defining of the university student identity (Livingstone et al., 2011; Livingstone & McCafferty, 2015). University students’ intended alcohol consumption is indeed greater when the perceived norm advocated heavy consumption – student identification moderated the impact of norms on consumption intentions (Livingstone & McCafferty, 2015). Furthermore, the association between drinking norms and self-reported weekly alcohol consumption is

stronger among students who view their university's student body as part of their own identity and are more committed to their fellow students (Rinker & Neighbors, 2014; see also Dumas et al. (2018) for similar findings in an adult non-student sample). University students may even perceive ingroup-associated alcohol as less risky to consume, but these findings stem from research categorised as low quality (Loersch & Bartholow, 2011). A range of other studies have also shown how student identification serves as a moderator in the relationship between perceived normative behaviour and personal alcohol consumption (e.g., Johnston & White, 2003; Livingstone et al., 2011; Neighbors et al., 2010; Reed et al., 2007). However, in contrast, and of relevance to health messages and interventions aimed at reducing health risk behaviours, associating alcohol consumption with an outgroup with which student participants did not want to be associated resulted in the reporting of decreased alcohol consumption (Berger & Rand, 2008).

Social pressure was identified as a process implicated in the negative relationship between student identity, norms, and alcohol consumption. Social pressure was generally conceptualised across most of the included studies as the tendency to place social pressure on ingroup members to conform to the perceived group norms (i.e., 'normative pressure'; e.g., see Livingstone et al., 2011; Elliott, 2010). For example, students who highly identified with a student identity placed greater social pressure on peers who did not drink alcohol when the perceived norm advocated moderate drinking (Livingstone et al., 2011). Furthermore, perceived pressure to consume alcohol from other students with which student participants identified positively predicted intentions to binge drink (Johnston & White, 2003). Findings from a (low quality) qualitative study corroborated how social identification and social pressure were key motivating factors in university students' alcohol consumption (Govender et al., 2015). Social

pressure is not only evident in relation to alcohol consumption among students but also concerning dietary behaviour. Asian American students chose food that was perceived to be more American (and thereby unhealthy) when their American identity was threatened. They felt pressured and to prove that they belonged and fitted in with the group (Americans) they chose more prototypically American food (Guendelman et al., 2011). Additionally, people who highly identified with a student identity conformed to perceived dietary norms, regardless of whether they were unhealthy (Louis et al., 2007).

Numerous studies also examined the implications of social pressure for other types of health risk perceptions and behaviours. For example, people were more likely to conform to drink walking (e.g., crossing a road while intoxicated) in the presence of others with whom they identified (McGhie et al., 2012). A qualitative study by Tunnicliff et al. (2011) found that identification as a motorcyclist related to expectations of mutual social support from ingroup members if something went astray. More importantly, ingroup members could inspire risky behaviours through, for example, challenging each other to engage in a race. These findings reflect the findings of quantitative research evidencing how social identification, social pressure, and group norms were associated with risky road behaviours (e.g., Elliott, 2010; Scott-Parker et al., 2009). On the other hand, perceived risk of road accidents and their likelihood increased when risk-information concerned ingroup members (Stapel et al., 1994). Similarly, being in the presence of some ingroup members (e.g., family members) curtailed risk behaviours through a desire to be viewed favourably by these ingroup members and protect their health. For example, motorcyclists may avoid speeding (Tunnicliff et al., 2011), and smokers may refrain from smoking near these ingroup members (Phillips et al., 2007). Together, these latter findings concern belonging to and identifying with multiple groups, highlighting how health-related behaviours shift

depending on salient group memberships. Put differently, risk behaviours may be acceptable and normative in some groups but not in others where health-protective norms are endorsed instead.

Concerning social pressure, a process identified to be implicated in the adherence to unhealthy group norms is a desire to affirm a specific social identity. A qualitative study with young women (Koesten et al., 2002) reflecting retrospectively on their adolescence concluded that adhering to unhealthy group norms (e.g., alcohol consumption, drug use, smoking, and sexual risk-taking) was motivated by a desire to fit in and fear of being rejected by the group. These risk behaviours were particularly prominent among participants who were less apt at communicative self-efficacy (i.e., the belief that one is a competent communicator and able to justify one's stance to group members). Four additional qualitative interview and focus group studies of adolescents (Banwell & Young, 1993; Lennon et al., 2005; Lloyd et al., 1997; McLeod et al., 2008) echoed this notion. They also implied that adolescents not only engage in risk behaviours to fit in with and be accepted by a social group, of which some risk behaviours are an integral part, but also to affirm a distinct social identity (e.g., developing an adult identity or belonging to the 'trendy/cool' group). Furthermore, Banwell and Young (1993) reported that young women who smoke might perceive anti-smoking messages as attempting to deny their right to express their social identity – the messages may therefore have little effect on these groups. However, it is important to note that this study was categorised as low quality.

### ***Theoretically Discordant Findings***

Three studies identified through the search which drew on the social identity framework reported findings that contradict the principles outlined by the framework. Firstly, Banas et al. (2016) found that undergraduate students and Mechanical Turk workers

who highly identified with their nationality (i.e., Australian or American identity) or gender identity (i.e., female identity) made dietary choices that went against the presented norm. They preferred unhealthier food and ate more food when presented with a healthy group norm and healthier food when presented with an unhealthy group norm. The authors speculated that high identifiers were less motivated to engage in healthy behaviours as they inferred from the norm information that they had already fulfilled a shared group norm of healthiness. However, this was the only study included in this review to report a contradictory effect of identity-based norms. An alternative interpretation of the findings is that high identifiers did not perceive the presented norm information as representative of the norms associated with their nationality and therefore did not adhere to the presented norm; instead, they engaged in behaviour they perceived as normative. Relatedly, the authors acknowledged that high identifiers might have rejected the unhealthy norm and made healthier food choices to demonstrate that the presented norm was unrepresentative of their social identity.

Wu et al. (2015) examined the effect of infectious diseases on ingroup derogation. They found that participants were more likely to reject an ingroup member infected with a disease than an outgroup member. The authors suggested that this may be because a greater likelihood of contact with an ingroup compared to an outgroup member poses a greater threat of disease transmission. However, the authors also suggested that the intergroup prime of the study that made ingroup versus outgroup identities salient may have prompted participants to almost exclusively respond to ingroup members to achieve optimal efficiency in infection avoidance (see ‘the behavioural immune system’; e.g., Schaller & Park, 2011). Participant responses may have differed if presented with ingroup or outgroup members separately. The study was also categorised as low quality. Along similar lines, Frank et al. (2015) found that identification with

characters in a film about an infectious disease was positively associated with perceived susceptibility to the disease and threat but negatively with perceived severity of the disease.

## **Discussion**

This systematic scoping review of the literature aimed to examine the implications of social identity processes for health risk perceptions and behaviours in non-mass gathering settings and to consider how these processes can generalise to mass gatherings. The review synthesised the findings from 90 published articles, elucidating the multifaceted ways social identity processes impact a range of health risk perceptions and behaviours, both negatively and positively. The positive health-implications have been discussed extensively elsewhere (e.g., see C. Haslam et al., 2018; Jetten et al., 2012, 2017) and are not further discussed here as it was not the focus of the review. Rather, the main body of this discussion section is divided into three main components concerning the negative implications of social identity processes for health risk perceptions and behaviours. First, a summary of the findings is provided. Second, an interpretation of the findings from the lens of the social identity approach (social identity theory/self-categorisation theory; SIT/SCT) is presented. Third, the potential implications of the findings for health risk perceptions and behaviours in mass gatherings are addressed.

### **Summary of Findings**

The findings of this review strongly indicate that social identity processes can be negatively implicated in health risk perceptions and behaviours. However, this relationship is complex and dependent on types of social identities and their social contexts. Some social identities were consistently associated with health-impairing perceptions and behaviours. For example, student identity and alcohol consumption



(e.g., Johnston & White, 2003, Reed et al., 2007; Livingstone & McCafferty et al., 2015), non-heterosexual sub-identities and sexual risk-taking (e.g., Reisner et al., 2009; Willoughby et al., 2007), and ‘non-mainstream’ social groups and substance use (e.g., Jordan et al., 2019; Hopmeyer & Medovoy, 2017). Social identities could also act as health-protective and health-impairing factors simultaneously. For example, ‘populars’ engaging in UV tanning (Stapleton et al., 2008; categorised as low quality) but not substance use (e.g., Jordan et al., 2019) and ‘jocks’ engaging in excessive alcohol consumption but not drug use (e.g., Hopmeyer & Medovoy, 2017; categorised as low quality). Furthermore, a few studies reported a negative relationship between some social identities and health risk perceptions and/or behaviours. By contrast, other studies reported no relationships or relationships in the opposite direction. These disparities were particularly prevalent among studies concerning stigmatised minority group identities (i.e., ethnic, racial, and cultural identities and non-heterosexual identities). For example, some studies suggested that ‘gay identity’ was positively associated with a range of health risk behaviours, such as substance use and sexual risk-taking (e.g., Chae & Yoshikawa, 2008), whereas others found no association (e.g., Flores et al., 2009) or a negative association (e.g., Card et al., 2017; Chng & Geliga-Vargas, 2000).

The overall evidence suggests that merely identifying with a social group can shape health-impairing perceptions and behaviours. Relatedly, the majority of studies focused on the interrelationships between health risk perceptions and behaviours and their predictors/antecedents (e.g., the prevalence of and attitudes towards engaging in health risk behaviours) and typically did not examine underlying mechanisms. A few exceptions were primarily made by articles examining peer crowd identification and student identification, which presented relatively few studies examining underlying

mechanisms (e.g., Verkooijen et al., 2007; Livingstone & McCafferty et al., 2015). These studies mainly examined and elucidated group norms as underlying mechanisms; group members endorsed health risk behaviours if they perceived these behaviours to be normative of the group. Moreover, meanings ascribed to social identities were generally not examined in the included studies, which could explain inconsistencies in findings (e.g., the disparate findings concerning minority group identification). A substantial body of the included literature therefore does not add significantly to the objective of the review. That is, although the studies examined and elucidated relationships between social identities and health risk behaviours and perceptions, they typically did not examine (or explain) the social identity processes underpinning these relationships, or examine meanings ascribed to the identities. In line with this, the findings will now be interpreted and explained in terms of SCT/SIT processes.

### **An Interpretation of the Findings from the Lens of the Social Identity Approach**

The relatively few studies that examined underlying processes identified primarily perceived group norms to underpin the identification-health risk relationship (e.g., group norms could act as mediators and moderators in the relationship). Group norms define the group, regulate group members' behaviours, and distinguishes the group from other groups (Abrams & Hogg, 1990; Hogg, 2001; Hogg & Reid, 2006; Hogg & Smith, 2007; Turner, 1991; Turner et al., 1987). Self-categorising as belonging to a specific group – and thereby deriving a social identity from the group – motivates cognition and behaviour that is perceived as characteristic (prototypical) of the group (i.e., it motivates engaging in the perceived norms of the group) (Hogg, 2001; Hogg et al., 2012). In other words, it is the normative understanding of what it means to belong to a particular social group that motivates its group members to engage in particular health-related behaviours. Whether a group adopts health-impairing or health-protective

norms depends on the understanding that group members prescribe to the social category with which they identify. Social groups associated with unhealthy behaviours endorse unhealthy norms. For example, students view alcohol consumption as normative and defining of the student identity (e.g., Livingstone et al., 2011) – they may therefore engage in this behaviour to embody the group prototype (i.e., to fit in). As such, undermining specific health risk perceptions and engaging with specific health risk behaviours may be defining of membership in some social groups.

What is more, groups compete to be distinct from other groups in favourable ways because group distinctiveness provides group members with a positive social identity (Hogg & Abrams, 1988; Tajfel & Turner, 1986). This pursuit of positive distinctiveness underpins various behaviours – a group may endorse specific health-related norms to positively distinguish their group from other groups. For example, ‘non-mainstream’ social groups are consistently associated with health risk behaviours and typically comprise individuals that are unlikely to perform well academically (Sussman et al., 2004). These groups are unlikely to be viewed favourably by others, yet a desire for identity distinctiveness is also a motivation among groups held in low regard (Hornsey & Hogg, 2002). Endorsing unhealthy norms may be a way for ‘non-mainstream’ groups to positively distinguish themselves from other groups which represent opposing norms, such as ‘conformist’ groups associated with healthy norms (and typically perform well academically; Sussman et al., 2004). Hence, ‘non-mainstream’ groups may view unhealthy traits as positively distinctive, and the endorsement of unhealthy norms may offer an alternative source of positive identity (see Emler & Reicher, 1995; Hornsey & Hogg, 2002). Similarly, ‘non-mainstream’ and sexual minority groups, such as ‘dirts’ and ‘bears’, are sub-identities of a superordinate identity (e.g., ‘XYZ high school student identity’ and ‘gay identity’, respectively). Each sub-identity has specific values

and norms, and these sub-identities often compete against one another to achieve distinctiveness (Hogg & Vaughan, 2018; Hornsey & Hogg, 2002). Engagement with health risk behaviours may be especially prevalent among particular sub-identities because they actively seek distinctiveness from other sub-identities and/or a superordinate identity, and/or because engagement with health risk behaviours is a prototypical attribute of these sub-identities. For example, if healthy behaviours are perceived as normative of an ethnic majority group, members of ethnic minority groups may be motivated to endorse unhealthy behaviours to distinguish themselves from the majority group (Oyserman et al., 2007).

In relation to the implications of broader/superordinate identities (e.g., ethnic, racial, and cultural identities and sexual minority identities) for health risk perceptions and behaviours, these identities exhibited greater variation. This variation may be because members belonging to and identifying with these groups are unlikely to comprise a homogenous population and thereby ascribe to different normative understandings of what it means to belong to and identify with the group. On the other hand, belonging to and identifying with stigmatised groups may in and of itself have adverse implications for health risk perceptions and behaviours because members of these groups are likely to experience higher levels of stress resulting from discriminatory experiences and have reduced access to social capital (e.g., see Heim et al., 2011; Pascoe & Smart Richman, 2009). This makes it particularly important to take into account sub-identities within superordinate identities and the implications that their respective normative understandings of sub-group membership have for health risk perceptions and behaviours.

As indicated by the findings of this review, attending to how normative understandings concerning health risk perceptions and behaviours may vary between groups and social

contexts is important. For example, assuming that all high school students, university students, members of sports groups, and members of racial, ethnic, cultural, and sexual minority groups adhere to the same norms around health risk perceptions and behaviours is problematic. Variation in findings based on the studies in the review for these social identities are highly likely to be explainable by differing social contexts and understandings of what it means to belong to these groups, and how some of these different understandings are tied-up in distinct sub-identities, and, in turn, distinct health-related behaviours.

Nonetheless, another process found to be implicated in the identification-health risk relationship, and which is closely related to norms, was social pressure – also referred to as ‘normative pressure’ in social identity terms, as will be the case henceforth.

Normative pressure is the pressure to adhere to a group norm that defines oneself as a group member (i.e., embodying the group prototype; Hogg et al., 2012). That is, people are influenced by their group members for reasons of social approval and acceptance, and embodying the group prototype (Turner, 1991); people seek to increase similarity with ingroup members by behaving in accordance with the perceived norms of the group (Hogg & Abrams, 2003). Group members may engage in health risk behaviours that are perceived as normative of the group because they feel pressured to do so and high identifiers may indeed subject others to pressure to adhere to the perceived group norm. For example, perceptions of normative pressure encouraged alcohol consumption among students (e.g., Johnston & White, 2003; Govender et al., 2015) and students who highly identified with the student identity tended to pressure others to drink (Livingstone et al., 2011).

Feeling that one belongs to a group is an intrinsic drive as it elicits a sense of identity, self-esteem, and self-worth (Tajfel & Turner, 1979; 1986). People who feel that their

social identity, or belonging in the group, is being questioned, through the process of normative pressure, may engage in prototypical but unhealthy behaviour to demonstrate – to themselves and ingroup members – that they belong and fit in with the group (e.g., Guendelman et al., 2011). Moreover, members of some social groups may find it more difficult to resist normative pressure to engage in risky behaviours than members of other groups (e.g., Kipke et al., 1997). Whether group members adhere to normative pressure is dependent upon social context. There may be contexts where achieving identity distinctiveness or validating one's social identity by embodying the group prototype is particularly important to maintain group membership. It is in such contexts normative pressure may have a stronger influence on health-related behaviour. To illustrate, many studies concerning excessive alcohol consumption sampled undergraduate students – a context where social acceptance can be particularly important (e.g., when starting university; Buote et al., 2007; McMillan, 2013). Starting university involves a major life transition and thereby social identity transition wherein a new group membership is sought (Iyer et al., 2009). Moreover, as discussed in Study 1 of the thesis, a large body of literature has identified that conformity to norms can be motivated by a desire to gain affiliation or social approval (e.g., Cialdini & Goldstein, 2004; Wood, 2000). Resisting normative pressure may be particularly difficult under such circumstances, and students may therefore engage in excessive alcohol consumption to demonstrate and maintain their (new) status as a worthy ingroup member.

In relation to validating social identity by embodying the group prototype through norm adherence, some studies indicated that people might engage in health risk behaviours to affirm a distinct social identity (e.g., belonging to the 'trendy' group at school; Koesten et al., 2002; Mcleod et al., 2008; Lennon et al., 2005; Lloyd et al., 1997). That is, the

intrinsic drive to obtain a positive identity could be achieved by joining ‘high status’ groups (Brewer et al., 1993). However, to be accepted by these groups, one has to embody the group prototype, which may encompass engaging in group-defining unhealthy norms, to demonstrate group fit. More specifically, people are viewed favourably by group members to the extent that they are perceived to embody the group prototype (Hogg et al., 2012; Steffens, Peters, et al., 2019; Turner et al., 1987) – this may motivate people to engage in perceived norms of the social identity in question (e.g., smoking) to display prototypicality.

Overall, then, an overarching process that appears to underpin the social identity-health risk relationship is that of unhealthy norms, and this can be divided into two sub-dimensions (or ‘sub-processes’): (1) normative pressure and (2) identity affirmation. It is the perception of norms that motivates engagement with health risk behaviours, and the reasons for why this occurs is because people feel pressured to do so or may do so because it is a mean to affirm their identities. The exact processes by which people engage in unhealthy group norms are shaped by social context. More specifically, there may be greater normative pressure to engage in unhealthy norms for some social identities in some contexts, and unhealthy norms may also be more central prototypical attributes of some social identities. Furthermore, meaning ascribed to a given social identity is paramount as it determines what is perceived as normative or non-normative for the identity or group. Health risk behaviours may be more identity-defining for some identities due to social context, which encompasses not only immediate social comparative context, but also broader historical, cultural, and political context and processes (e.g., ethnic minority groups in ethnic majority contexts; Oyserman et al., 2007; Guendelman et al., 2011). Due to the same contextual processes, it is more important for some groups that members embody central prototypical characteristics,

including engagement with health risk behaviours. The potential implications of these key processes for health risk perceptions and behaviours in mass gathering contexts will now be considered.

### **Potential Implications of Social Identity Processes in Mass Gatherings**

In the context of mass gatherings, such as music festivals and religious gatherings, attendees' social identity as, for example, a 'festival-goer' or 'pilgrim' will become salient. Their perceptions and behaviours will change in accordance with what they perceive to be prototypical of the salient social identity. That is, a normative understanding of what attending a particular mass gathering entails will emerge, which will shape cognitions and behaviour – including health risk perceptions and behaviours (Reicher, 2012). Some mass gatherings may be particularly associated with unhealthy but normative behaviours. For example, using recreational drugs at electronic dance music (EDM) festivals (Mohr et al., 2018; Palamar et al., 2018) may be perceived as normative. By contrast, sharing paraphernalia (e.g., razors or blades at the Hajj; Rafiq et al., 2009) as part of a religious ritual may be perceived as normative in religious gatherings.

However, the 'festival-goer' or 'pilgrim' identity can be thought of as a superordinate identity. Group members will be motivated to adhere to the normative understanding of what these identities entail in different ways, leading to the development of sub-identities in mass gatherings with unique norms and values. It is therefore particularly important to recognise sub-identities in mass gatherings and the implications of their respective normative understandings for health risk perceptions and behaviours. For some – but not all – sub-identities, the normative understanding might be that that using recreational drugs or drinking excessive amounts of alcohol at EDM festivals is not only acceptable and common but also identity-defining. It could even be considered to



contribute towards achieving identity distinctiveness. Hence, EDM festival attendance for these types of sub-identities could be about relaxing precautions and breaking social norms one would not normally break. Some EDM festival-goers may therefore engage in health risk behaviours that are perceived to be normative, validating their self-categorisation and group membership, even if they do not usually engage in these behaviours in other contexts wherein other social identities are salient. In a similar vein, some attendees of religious gatherings may engage in normative but risky religious rituals to demonstrate, to themselves and others, that they are prototypical and worthy members of the religious group. Engagement in health risk behaviours in mass gatherings may also be further exacerbated by normative pressure. That is, attendees may feel pressured to engage in health risk behaviours, and some attendees may indeed actively exert pressure on others. For example, some attendees may engage in risky religious rituals or substance use to be accepted by the group; some group members may also pressure others to engage in these behaviours as they are viewed as central prototypical attributes of the group. There are health risk behaviours that, in fact, are central to some religious mass gatherings, such as swimming in and drinking the polluted Ganges water at the Magh Mela (Hopkins & Reicher, 2017) and bodily mutilation at the Thaipusam (Xygalatas et al., 2019).

Furthermore, health risk behaviours may be more defining for some identities due to social context, engendered by historical, cultural, and political processes. It may thus be more important for some sub-identities in mass gatherings to ascribe and embody central prototypical characteristics. The confluence of sex, alcohol, and drug use at pride parades and festivals (Shuper et al., 2018; Spivey et al., 2018), which celebrate historically stigmatised minority identities (i.e., non-heterosexual identities), could be due to the expression of identity-defining behaviour among sub-identities. Subscribing

to central prototypical characteristics to achieve identity distinctiveness and thereby a positive identity may be particularly important for these stigmatised minority groups in these contexts. Taking into account the variations in normative understandings concerning health risk perceptions and behaviours depending on the type of sub-identity and the social context of the mass gathering is therefore important.

### **Implications**

The reviewed literature was multidisciplinary and published in a wide variety of journals. An important contribution of this review has therefore been to synthesise this disparate literature to provide an accessible account of the implications of social identification processes on health risk perceptions and behaviours. The review complements research that has advanced the understanding of the implications of social identity processes for health risk perceptions and behaviours in a variety of contexts (L. F. Campbell & Stewart, 1992; Livingstone et al., 2011; Livingstone & McCafferty, 2015; Oyserman et al., 2007; Tarrant & Butler, 2011).

Given the recent theorisations of how the ‘social curse’ may operate in mass gathering contexts (e.g., see Hopkins & Reicher, 2016a; 2017) and related preliminary evidence presented in Study 2 and 3 of the thesis, the review is particularly timely. To this end, the review has furthered theorisations concerning how social identity process may undermine health risk perceptions and behaviours in mass gatherings. The outlined social identity processes have important implications for health-related behaviours and perceptions, and health interventions aimed at mitigating mass gathering-associated health risks. The pertinent question then is how health interventions can capitalise on social identity processes to mitigate mass gathering-associated health risks and ascribe different meanings to behaviours, to encourage healthy behaviours or discourage unhealthy behaviours. This question will be further addressed in Chapter 7, comprising

a qualitative study exploring the views of healthcare professionals with experience of providing healthcare in mass gatherings.

The findings are relevant to social psychologists engaged with research in line with the ‘social cure’ and ‘social curse’ paradigm. They should also be of interest to the multidisciplinary field of mass gathering medicine, health researchers, and policymakers who seek to understand and address how health behaviours and outcomes are embedded in psychosocial factors and processes. This is in line with the WHO’s (2015) broader research agenda, which now prioritises psychosocial factors in the development and implementation of interventions to mitigate mass gathering-associated health risks. Overall, the review offers a starting point for investigations concerning what social identity processes are important to consider in relation to health risk perceptions and behaviours in mass gatherings – both in terms of aggravation and mitigation of health risks.

### **Limitations and Directions for Future Research**

This study represents a systematic inquiry into the current status of the research linking social identity processes to health risk perceptions and behaviours; it was never the intention to provide a detailed account of the studies included in the review. Instead, the nature of the review enabled a theoretical overview of health-impairing functions of social identity processes.

The review was limited to articles written in English because of time and resource constraints, which may have introduced bias. Due to these constraints, the search did also not include grey literature, theses, conference presentations or material published in books, which may have led to the exclusion of relevant studies. The search terms for the social identity and health risk perceptions and behaviours concepts were non-

specific (i.e., they did not refer to specific health risks or identities, such as ‘smoking’, ‘smoker identity’ or ‘alcohol use’). Hence, this review did not locate *all* empirical studies that met the inclusion criteria – the inclusion of a large number of articles identified through other sources (i.e., manually searching included articles’ reference lists) presumably reflects this. Future narrower reviews may therefore wish to revise the search strategy and exclusion/inclusion criteria. This review has nevertheless collated a wealth of representative evidence of the negative health implications of social identity processes; a modified search strategy may therefore not have added imperative evidence for a scoping-type review.

The generalisability of this review should reflect that the settings and samples of the included studies were mainly from the US and students (school and university level alike). The variety in the quality of the studies included in the synthesis should also be acknowledged as no study was excluded based on poor quality – albeit this is not necessary for a scoping review and may, instead, lead to important insights being disregarded (Hannes, 2011). Finally, the search was carried out in early 2018 – any studies published since this date that meet the inclusion criteria have not been included in this review.

Despite its limitations, this review’s mixed methods approach enabled a comprehensive and more nuanced understanding of the implications of social identity processes for health risk perceptions and behaviours. The studies included in the review used a range of study designs, measures, and analyses in a variety of research settings. Most of the included studies outlined, justified, and employed rigorous methodology and used appropriate methods of analysis and standardised measures. As for the limitations of the included studies, lack of justification for using specific measures and statistical assessment of their reliability and validity was a common shortcoming among the

quantitative studies. The lack of engagement in best practice for scale construction within social psychological research has been described in detail by Flake et al. (2017) and was apparent during the process of quality appraisal of the included studies. Similarly, description and justification for the analytical method and assessment of the reliability of the analytical process in qualitative studies were, for the most part, below standard.

Most included studies employed quantitative cross-sectional survey designs – comparatively few studies employed longitudinal designs, and no study encompassed a randomised controlled trial (RCTs). Conducting RCTs and additional longitudinal research would not only allow stronger claims of causation to be made but also modelling of change in both social identity and health risk perceptions and behaviours over time. However, it is important to highlight that the relationship between social identification and health-related outcomes was consistently either positive or negative across different methodologies (e.g., cross-sectional versus longitudinal) – with a few exceptions. Furthermore, most quantitative studies examined direct relationships, comparatively few conducted mediation or moderation analyses to uncover underpinning mechanisms. Qualitative and mixed method research designs were largely underrepresented in the reviewed literature – such research could offer a novel way to disentangle processes underlying the social identity-health risk relationship. In line with this, and central to the thesis, future research should explore whether the processes identified in this study also undermine health risk perceptions and behaviours in mass gathering contexts – a qualitative inquiry seems appropriate to this end. Through an enriched understanding of the health-impairing effects of social identity processes, future research can systematically pinpoint how to mitigate mass gathering-associated health risks generated or governed by social identity processes. Another striking

observation from the review was the limited breadth of examined health risk perceptions and behaviours. These tended to focus on substance use (smoking tobacco and marijuana in particular), alcohol consumption, and sexual risk-taking, resulting in a broad avenue for future research examining a different range of health risk behaviours.

## **Conclusion**

This study is the first to systematically identify, appraise, synthesise, and examine the literature concerning the implications of social identification for health risk perceptions and behaviours. Beyond highlighting the negative relationship between social identification and health risk perceptions and behaviours, the review has unearthed important processes that underpin this relationship: engagement with unhealthy norms brought about by normative pressure and the affirmation of social identities.

Furthermore, the review has considered how these processes may be implicated in health risk perceptions and behaviours in mass gatherings. The importance of considering meanings ascribed to different types of social identities and the social context was emphasised. Understanding when and why social identity processes negatively affect health risk perceptions and behaviours is essential in the design of health interventions. Insights gathered through this review can help shape future research concerning mechanisms underlying the social identity-health risk relationship and how to mitigate mass gathering-associated health risks. On a final note, the review has primarily focused on the negative implications of social identification for health – the social curse. This focus helps consolidate understanding of the nature of the relationship between social identification and health risks as focus has tended to be placed upon the beneficial effects of social identification – the social cure. A balanced perspective is needed to best apply this accumulated knowledge in the pursuit of enhancing health and mitigating risks in mass gatherings and beyond.

## **CHAPTER 7: A Qualitative Interview Study with Mass Gathering Healthcare**

### **Professionals (Study 5)**

#### **Chapter Overview**

While maintaining a primarily deductive research approach, this chapter also takes an inductive research approach to address the aggravation and mitigating of mass gathering-associated health risks from a social identity perspective. The chapter presents the final empirical study of this thesis – a qualitative exploration of mass gathering healthcare professionals’ understandings of social identity processes and health risks at music festivals and a religious pilgrimage. An introduction to the study is first presented and followed by a manuscript reporting the study, which has been published in *Social Science & Medicine* (see Hult Khazaie et al., 2021). Apart from slight alterations to increase clarity in relation to the thesis (e.g., appendices), it is the published manuscript that is presented. A reflexivity statement concludes the chapter.

#### **Introduction**

Study 2 and 3 (Chapter 5) demonstrated through quantitative research designs that social identification impairs health risk perceptions in mass gatherings. Two systematic reviews (Study 1 and 4) explored the negative social identity-health risk relationship in non-mass gathering and mass gathering contexts and identified social identity processes that may underpin health risk perceptions and behaviours in mass gatherings. This study sought to elaborate upon and contextualise the negative social identity-health risk relationship in mass gatherings. The purpose of the study was therefore to build upon and extend the quantitative studies and the reviews by introducing a qualitative exploration of social identity processes that may be implicated in the negative social identity-health risk relationship in two types of mass gatherings: music festivals and a religious pilgrimage. This approach can contribute to both corroborating previously

identified processes and unearthing additional key processes that may be implicated in the aggravation and mitigation of mass gathering-associated health risks. As such, this study was also conducted to explore how social identity processes may be drawn upon in health interventions to manage and mitigate health risk behaviours in mass gatherings. Furthermore, examining two different mass gathering contexts (i.e., music festivals versus a religious pilgrimage) allowed for observations to be made regarding contrasts in how social identity processes are implicated in mass gathering-associated health risks between different types of events. In qualitative research, the researcher's goal is indeed to expand upon and generalise theories (Hyde, 2000); qualitative research examines a topic area in-depth and can highlight important aspects that previous deductive research has potentially overlooked or not considered (Willig & Stainton-Rogers, 2017).

In this study, healthcare professionals volunteering for event medical services were interviewed about their perceptions and experiences regarding social identification and mass gathering-associated health risks and completed a brief survey. The WHO (2015) define event medical services as “healthcare services which provide care to those injured or ill at an event or in the immediate vicinity. Healthcare professionals providing such services may include physicians, nurses, ambulance workers / paramedics / emergency medical technicians and first aid trained individuals” (p. 120). The definition therefore encompasses a wide range of healthcare professionals, including those who may not necessarily have obtained a university-level degree in healthcare. A wide range of healthcare professionals were, accordingly, recruited for this study (e.g., first aid trained, nurse, and medical doctor). The study approach is in line with previous social identity and crowd behaviour research that has involved interviews with staff operating at mass gathering events (see Drury et al., 2015).



However, in contrast to the present study, Drury et al.'s (2015) study focused on crowd safety professionals' perceptions of crowd behaviour in an emergency. As suggested in Chapter 4 (Study 1 – a systematic review), to gain a more nuanced perspective of crowd behaviour and health risks, research should not only obtain event attendees' accounts (and arguably theoretical accounts by researchers) but also the views of those who provide medical services in these settings.

The perceptions and experiences of healthcare professionals were examined for several reasons. The utility of the social identity approach to understanding and mitigating mass gathering health risks appears to, so far, only have been propagated by Hopkins and Reicher (2016b, 2016a, 2017). Moreover, empirical research to date only consists of Study 2 and 3 of the thesis (see Chapter 5; Hult Khazaie & Khan, 2020). These studies are limited to examining social identity processes and health outcomes using pre-operationalised and closed-ended self-report measures. To this end, it seems appropriate to consult those attending to health risks and behaviours in the field – healthcare professionals. Healthcare professionals with first-hand experience of providing healthcare in mass gatherings could offer valuable and novel 'on the ground' insight into the phenomenon. It is also important to explore if, and if so, how healthcare professionals understand in what ways health risk perceptions and behaviours are embedded in social identity processes in mass gatherings. There is evidence to suggest that compliance with health interventions may be undermined if healthcare responders and other authorities at mass events do not appreciate the social identity dynamics that occur in mass gatherings (e.g., because crowd members view the interventions as illegitimate; see Carter et al., 2018).

Semi-structured interviews are frequently used as a data collection method in mixed methods research (Bryman, 2006). In this type of interview, the researcher uses an

interview schedule encompassing a set of predetermined questions to guide the interview, but the researcher may choose to ask the questions in any order, exclude questions or formulate new questions based on the interviewee's responses (Banister et al., 2011). Consequently, semi-structured interviews provide flexibility to probe and explore participants' responses, including – and importantly – issues that have been overlooked or not previously considered by the researcher (Willig & Stainton-Rogers, 2017). This interview technique was therefore considered the most appropriate for the study.

Henceforth, the authors of the manuscript presented below are referred to as 'DHK' (Daniella Hult Khazaie; first author and author of this PhD thesis), SK (Sammyh Khan; supervisor), and CS (Clifford Stott; supervisor). There are limitations to this research that have not necessarily been discussed in the manuscript, but that are appropriate to address here. First, there is inevitably a risk that the authors' interests and knowledge of related theories and research may have limited or influenced the analysis. The analysis involved a deductive approach, informed by the social identity approach to health, and supplemented by inductive elements. The authors are social psychologists with a research focus on the social identity approach to crowd behaviour. On the other hand, all authors were involved in the analysis, ensuring that multiple independent interpretations of the data had been considered (see 'investigator triangulation'; Archibald, 2016). Second, although this study first set out to conduct solely face-to-face interviews with nurses from Keele University and an associated diocese who provided healthcare at Lourdes (a catholic pilgrimage in France; see Chapter 1), the sample size proved too small for the study to be feasible. The research approach and focus were therefore changed, and participants were sought from other types of healthcare teams and mass gatherings – the final sample comprised healthcare professionals from both

Lourdes and a range of UK-based music festival event medical services. Hence, telephone interviews were selected as an option because of the potential widespread geographic location of participants, but this method of interviewing has been criticised due to the absence of visual cues; this may hinder establishing rapport and depth of responding (Novick, 2008). To ameliorate this potential limitation, the interviewer (DHK) employed a range of techniques shown to cultivate rapport (e.g., active listening, supportive vocalisation, and communicating appreciation for the participant's contribution; Drabble et al., 2016).

This concludes the introduction to the qualitative interview and brief survey study. The rationale and the employed methods are further outlined in the manuscript. What follows is the published manuscript.

## **Abstract**

### **Rationale**

The field of mass gathering medicine has tended to focus on physical factors in the aggravation and mitigation of health risks in mass gatherings to the neglect of psychosocial factors.

### **Objectives**

This study sought to explore perspectives of healthcare professionals (HCPs) on (1) implications of social identity processes for mass gathering-associated health risks; and (2) how social identity processes can be drawn on to inform and improve healthcare practices and interventions targeted at mitigating health risks in mass gatherings.

### **Method**

Semi-structured interviews, complemented by a brief survey, were conducted with 17 HCPs in the United Kingdom operating at a religious pilgrimage and music festivals.

### **Results**

The findings from a thematic analysis suggest that HCPs recognise that social identity processes involved in identity enactment in mass gatherings are implicated in health risks. HCPs also perceive value in drawing on social identity processes to inform and improve healthcare practices and interventions in mass gatherings. The findings from the survey corroborate the findings from the interviews.

### **Conclusion**

Taken together, the research highlights avenues for future research and collaboration aimed at developing healthcare practices and interventions informed by the social identity approach for the management of health risks in mass gatherings.

## **Mass Meets Mosh: Exploring Healthcare Professionals' Perspectives of Social Identity Processes and Health Risks at a Religious Pilgrimage and Music Festivals**

From a healthcare perspective, mass gatherings – such as music festivals and pilgrimages – present complex and multifaceted health risks that can strain healthcare systems (e.g., disease transmission, environmental stressors, and substance misuse; Memish et al., 2019; World Health Organization (WHO), 2015). Yet, as an emerging and rapidly evolving multidisciplinary field, mass gathering medicine remains theoretically underdeveloped (Memish et al., 2019; Steenkamp et al., 2016). Research and practice have tended to focus on physical factors in the aggravation and mitigation of risks in mass gatherings, while often ignoring psychosocial factors (Hopkins & Reicher, 2016a, 2016b, 2017). The WHO (2015) has recognised this paucity and highlighted the need for mass gathering management and research to “consider psychosocial elements in the planning and monitoring of events to ensure public safety” (p. 149). The present research provides a social-psychological perspective of the aggravation and mitigation of mass gathering-associated health risks by exploring perspectives of healthcare professionals (HCPs) operating in two mass gathering settings: a Catholic pilgrimage and music festivals.

Reviews of existing mass gathering literature have identified broad psychosocial factors underpinning health-associated risks (e.g., crowd demographics, motivations, culture, and mood; see Hutton et al., 2013, 2018, 2020). Hutton et al. (2018) suggest that it is important to consider motivations for attending events and subsequent health-related behaviours. For example, music festival attendees may be motivated to escape everyday life, and the use of alcohol and drugs may be integral to this end. Furthermore, crowd culture can include risky behaviours such as ‘moshing’ (i.e., attendees intentionally crashing into one another) at music festivals, the use of fire in religious rituals, and

excessive consumption of unhealthy food and alcohol at sporting events (Hutton et al., 2013, 2020). While this research has made a significant empirical contribution to mapping psychosocial factors implicated in mass gathering-associated health risks, it arguably remains theoretically underdeveloped.

A theoretical framework for understanding the psychosocial underpinnings of mass gatherings and health outcomes emanates from the social identity approach, comprising two complementary theories: social identity theory (Tajfel and Turner, 1979) and self-categorisation theory (Turner et al., 1987). The framework posits that people derive a sense of self based on their personal identity (i.e., as a unique individual) or their social identity (i.e., as a member of a valued social group). When a social identity is salient in a given context, people emphasise their similarities to fellow group members (i.e., the ingroup) and dissimilarities to non-group members (i.e., the outgroup) (Turner et al., 1987). Self-definition in terms of a social identity leads to the internalisation of group beliefs, values, and norms as it provides a social self-concept that prescribes cognitions, emotions, and behaviours normative in given social contexts. This shift from individual to shared social identities is the basis of trust, respect, cooperation, social support, and resilience in groups (e.g., Cialdini and Goldstein, 2004; Jetten et al., 2012; Platow et al., 2012). Shared social identities, in turn, shape health, with positive outcomes resulting from the availability of social support and/or adherence to healthy group norms (i.e., a ‘social cure’), and negative outcomes from lack of social support and/or adherence to unhealthy group norms (i.e., a ‘social curse’) (Dingle et al., 2019; C. Haslam et al., 2018; S. A. Haslam et al., 2018).

While the application of the social identity approach to health has been extensively examined and validated in smaller group settings, a growing body of research has started applying the approach to examining its implications for health outcomes in mass

gatherings. The social identity framework distinguishes between two types of crowds: physical and psychological crowds. People in 'physical crowds' have coincidentally aggregated in the same space (e.g., a busy shopping mall) and exhibit a strong sense of personal identity ('I/me') with idiosyncratic beliefs and values. By contrast, people in 'psychological crowds' have gathered for a common purpose (e.g., to attend a music festival) and shift from personal to shared social identities (e.g., 'we/us' festival attendees). Behaviours of different crowds will, in turn, vary as a function of the social identities that are salient in a given mass gathering context (Reicher, 2017). For example, religious pilgrims may subscribe to ascetic norms and values, whereas music festival attendees are more likely to endorse hedonistic norms and values (Hopkins and Reicher, 2016b).

Participation in psychological crowds is empowering because it provides a context for the enactment and realisation of shared social identities (Drury et al., 2005; Reicher, 2017). Regarding health outcomes, the experience of sharing a social identity in mass gatherings has been found to improve self-reported wellbeing and health among attendees. Perceiving a shared social identity with other pilgrims attending the Hindu festival Magh Mela in India was associated with positive affect – a relationship underpinned by the ability to enact their religious identity (Hopkins et al., 2016).

Pilgrims also reported improved self-reported health over time to the extent that they identified and experienced supportive relations with other pilgrims (Khan et al., 2015). Similarly, attendees of a festival for school leavers in Australia experienced mental health benefits when they experienced the event as an enactment of a valued social identity (Cruwys et al., 2019). On the other hand, the experience of sharing a social identity in mass gatherings can undermine health outcomes. Mass gathering attendees have reported decreased health risk perceptions and greater engagement with health risk

behaviours when they experience a sense of shared social identity because they also experience attenuated disgust and accentuated trust towards other crowd attendees (Cruwys et al., 2021; Hult Khazaie and Khan, 2019).

Social psychologists have proposed that the social identity framework can contribute to understanding the psychosocial underpinnings of health risks in mass gatherings, along with the development of healthcare practices and interventions designed to mitigate risks (see Hopkins & Reicher, 2016a, 2016b, 2017). Yet, empirical research has to date only consisted of two field studies (Cruwys et al., 2020) and two experimental studies (Hult Khazaie and Khan, 2019) limited to examining social identity processes and health risks using pre-operationalised and closed-ended self-report measures. While these studies have provided empirical ‘proof-of-concept’ evidence for the theoretical premise that sharing a social identity can aggravate health risks in mass gatherings, research has yet to examine the utility of the premise in the context of healthcare practices and interventions. Exploring the views of healthcare professionals (HCPs) attending to health risks in the field is, therefore, a logical extension of this line of research. The reason for this is twofold. First, given that healthcare practices and interventions may be seen as illegitimate if responders and other authorities at mass events fail to take into account psychosocial, identity-based, transformations in mass gatherings (see Carter et al., 2020), it is important to explore if, and if so, how HCPs perceive health risks to be implicated in social identity processes in mass gatherings. Second, HCPs with first-hand experience of providing healthcare in mass gatherings could offer valuable and novel ‘on the ground’ insight to inform how social identity processes can be drawn upon to improve healthcare practices and interventions in mass gatherings. Both lines of inquiry can lead to the identification of priority areas for research, research translation, and collaboration. Accordingly, the current study had two



aims: to explore the perspectives of HCPs on (1) implications of social identity processes for mass gathering-associated health risks and (2) how social identity processes can be drawn upon to inform and improve healthcare practices and interventions in mass gatherings.

## **Method**

### **Design**

The study employed individual semi-structured interviews and a brief survey; each participant completed both components. A qualitative interview method was selected as the primary data collection tool as it is suitable for exploring under-researched topics flexibly and in-depth (Green and Thorogood, 2018). The brief survey ensured triangulation of data to provide a more comprehensive perspective of the findings than either approach could achieve separately (R. Campbell et al., 2020). Furthermore, the survey complemented the qualitative approach in that it sought to gauge participants' perspectives about the role played by social identity processes in the aggravation and mitigation of mass gathering-associated health risks after having reflected upon this in-depth in the interview. Ethical approval was provided by Keele University's Psychology Research Ethics Committee (ref: PSY-190057; see Appendix O for the letter of approval).

### **Participants**

The sample consisted of 17 HCPs (6 males, 12 females) residing in the United Kingdom (UK). Participants fulfilling three essential criteria were recruited: (1) experience of delivering healthcare in a mass gathering setting; (2) HCP qualification; and (3) English language proficiency. Five participants were recruited from a UK-based nursing team providing healthcare for pilgrims at Lourdes in France and 12 via event medical providers (henceforth 'EMP') delivering healthcare at primarily large music

festivals. Information about the study was disseminated to HCP-teams via email. Interested HCPs contacted the first author and received further information about the study and agreed on a time for an interview. Informed consent was obtained at the time of the interview. An additional six HCPs indicated an interest in participating but did not schedule an interview due to time constraints (N =1) or other reasons (N =5). HCPs recruited via the EMPs primarily commented on their experiences concerning the UK-based music festivals Glastonbury, Reading, and Shambala, whereas HCPs from the Lourdes team solely reflected on the Lourdes pilgrimage. Participant characteristics are presented in Appendix P.

### **Materials and Procedure**

Individual interviews were conducted between July and November 2019 by the first author, a female Ph.D. candidate trained and experienced in conducting interviews. Twelve interviews were conducted over the phone and five face-to-face in secluded spaces. Following introductions and informed consent, participants were interviewed using a semi-structured interview schedule developed by the first author and edited by the third author (see Appendix Q). The schedule covered four areas: 1) experiences of providing healthcare in mass gathering settings; 2) prevalence and underpinnings of health risks in mass gatherings; 3) implications of social identity processes for health risks in mass gatherings, and 4) utility of social identity processes in the design of healthcare practices and interventions in mass gatherings. Follow-up questions were asked based on individual interview responses allowing for communication of unanticipated and deepened insight (Patton, 2002).

Interviews lasted between 24 and 69 min ( $M = 45.53$ ,  $SD = 12.09$ ) and were audio-recorded with participants' permission. After ending the interview, participants interviewed over the phone were asked to complete a brief survey hosted on the survey

platform Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)), whereas participants interviewed face-to-face were asked to complete an identical pen-and-paper survey. The survey contained five items developed for the study to assess beliefs about the importance of social identity processes in the aggravation and mitigation of mass gathering-associated health risks (items are presented in Table 10 under ‘Results’). Responses were collected using five-point Likert-type scales, anchored by the endpoints ‘1’ (‘Strongly disagree’) to ‘5’ (‘Strongly agree’). Participants were subsequently thanked, debriefed, and offered a retail voucher for their participation.

### **Data Analysis**

Interview audio-recordings were transcribed verbatim by the first author. As the accuracy of the interviews’ content rather than language patterns and non-verbal cues was prioritised, speech disfluencies and filler words were removed from the transcripts to improve readability (MacLean et al., 2004). Final transcripts were uploaded into NVivo 12 and analysed using thematic analysis, which was selected because of its flexibility in that it is not tied to any particular epistemological or theoretical framework and can generate complex and nuanced analyses (Braun and Clarke, 2006). The analysis was guided by the six steps outlined by Braun and Clarke (2006): 1) familiarisation with the data; 2) generation of initial codes; 3) searching for themes; 4) reviewing themes; 5) defining themes; and 6) producing the report. The first author was involved in all steps and the second and third authors were involved from step four onwards to ensure that the themes represented a credible analysis of the data (Shenton, 2004). There were no notable disagreements in the identification of themes between the authors.

A deductive approach was taken, informed by the social identity approach; segments of the transcripts concerning social identity processes and health risks were coded and

subjected to further analysis. Yet, the deductive approach was supplemented by inductive elements to allow for original insight unaccounted for by the theoretical framework. Furthermore, the analysis was conducted within an experiential, contextualist framework focusing on observations and interpretations conveyed by the HCPs in their own language (e.g., what they believed constituted social identity processes and their implications for health risks; Reicher, 2000). Data collection and analysis continued until saturation had been achieved (Saunders et al., 2018). The analysis discerned two overarching themes with five and three sub-themes, respectively. The first overarching theme concerned HCPs' perspectives on the implications of social identity processes for mass gathering-associated health risks. The second overarching theme concerned their perspectives on the role of social identity processes in healthcare practices and interventions in mass gatherings. There were no significant disagreements in the HCPs' accounts. Still, some HCPs were more articulate in their understanding of social identity processes, and some described particular dimensions in greater depth than others. Quotes have been selected to illustrate the themes. Within quotes, '...' indicates text has been removed for brevity, and text within brackets has been inserted for clarity. Quotes are followed by the participant key, 1–17 combined with 'L' or 'E', wherein the letters denote whether the participant was recruited from the Lourdes or EMP teams, respectively.

## **Results**

### **Perspectives on Social Identity Processes and Health Risks in Mass Gatherings**

This overarching theme addresses the first aim of the study: exploring HCPs' perspectives on the implications of social identity processes for mass gathering-associated health risks. Although HCPs reported health risks such as sun exposure, chronic condition complications, and sprains/fractures as highly prevalent within music

festivals, they primarily focused on alcohol and substance use when reflecting on the implications of social identity processes for health risks. As for Lourdes, the risk most prevalently discussed pertained to the frailty of elderly, disabled, and sick pilgrims and how they may compromise their health by engaging in religious rituals.

### **The Manifestation of a Shared Identity**

This theme explores HCPs' perspectives on a shared social identity among attendees in mass gatherings. Although some HCPs initially expressed that they found it difficult to articulate the concept of a shared social identity and its manifestations, they all believed that attendees typically share a social identity, and provided elaborate descriptions and examples reflecting their understanding of the concept. Several HCPs emphasised that attendees are united by the hardships of the mass gathering, strengthening their shared identity: "*There is a 'We're all in this together' attitude ... 'We're all in that field, in that burning sunshine or torrential rain and mud'*" (E14). Yet, this was suggested by a few HCPs to take precedence over healthier choices. Although "*very elderly and frail*" (L1), pilgrims insisted on leading a procession under extreme weather conditions and many became ill afterwards:

*It was absolutely pouring down with rain...It was horrendous and cold...They were all saying 'We've got to go because it's [our diocese] leading the pilgrimage and we've got to lead the way'...That's where it made me realise that sense of identity really. (L4)*

One HCP inferred that music festival attendees may use empathogenic substances to reinforce a shared identity:

*You get this group of festival-goers who come together because they like some particular type of music and then they all take this particular drug, this*

*ecstasy or MDMA, and then it just intensifies that group identity, brings them even closer together. (E12)*

HCPs described mutual social support as an expected etiquette within mass gatherings, expressing that “*it’s an expected norm...that everybody looks out for everybody else*” (E15). Reciprocity of support and trust, often manifested through resource sharing, even among attendees who were strangers to one another, was further emphasised:

*Everybody who’s sat around the bonfire will all be sharing the spliff and there’s no questions...It doesn’t matter whether the person sat next to [them] know them or not. (E15)*

*If somebody hasn’t got something, they’ll say ‘Oh have my towel, I’ve got another one.’ (L1)*

On the one hand, the amiable atmosphere associated with a shared identity was perceived to increase attendees’ acceptance and tolerance towards one another. On the other hand, the corollary of such an atmosphere, at music festivals, in particular, is the acceptance of risk behaviours, including underage drinking and substance use: “*People are more accepting of it happening. You wouldn’t accept ten fourteen-year-old teenagers who were off their heads on drink or drugs at a party*” (E17). HCPs further described nuances in identities within and between events, emphasising that some mass gathering- and sub-identities have stronger associations with unhealthy norms:

*If you’re next to the dance stand, by definition you will see a lot more people who take a lot more drugs...If you work at a different part of the site, maybe next to the circus or something like that, it’ll be a different clientele. (E17)*

### *Identity Shifts and Expressions*

Most HCPs identified that when people enter a mass gathering, they experience a shift to a more salient identity for the duration of the event. This theme, therefore, focuses on HCPs' descriptions of how shared identities become salient and are enacted, and to what purpose:

*You do leave something of your old self behind at the gate and you're somebody different while you're there. (E8)*

*I'm pretty sure when they get back home, most of them switch back into their normal selves. (E6)*

HCPs recognised that the basis for how event attendees define themselves is transformed by the mass gathering. They further explained how attendees' behaviours are shaped by the event-specific identity and how they come to embody and express this identity, which could involve engagement with health risks normative within the mass gathering context:

*We are uncertain what happens to the water you're being submerged in, people with wounds, people that have been incontinent, but there is definitely a norm that going to the baths is something that you do because you've gone to Lourdes and that's one of those expressions of your faith. (L1)*

Similarly, for some attendees, participating in a mass gathering may be part of affirming a distinct identity. HCPs described the normative practice of alcohol and substance use at Reading as “*a rite of passage for people when they've done their GCSEs*” (E15). Young people convene at Reading, which commences just after GCSEs have finished, to celebrate and mark the occasion. Attendance at Reading was therefore viewed as part of the transition from an adolescent to an adult identity:

*I think most of the drinking goes on with the underage...Well, it's that pressure, isn't it? To become an adult. Almost every sixteen-year-old will tell you... 'I'm an adult because I got nine grade nines of GCSEs.'* (E7).

This transition and affirmation of a new, distinct identity (i.e., that they belong to the 'adult category') was conveyed to be expressed through engagement with alcohol and substance use norms of the event. One HCP explained how this was also apparent concerning unprotected sex:

*Groups of girls come in...and they're all wanting the morning after pill...They make it some sort of pact between them that they're gonna have sex at the festival, to get that done, get that out the way.* (E6)

### ***Breaking Social Norms***

The following theme explores HCPs' perceptions of the motivations behind mass gathering attendance and risk behaviours. Several HCPs believed that attendance at music festivals may be motivated by a desire to break social norms one would not normally break in other social contexts. They described that the norms and conventions of society are often temporarily replaced by event-specific (potentially unhealthy) norms within the realm of the mass gathering:

*People are there behaving in a way that they don't necessarily behave in the rest of the time, in much freer...possibly hazardous circumstances.* (E14)

*I think that normal health behaviours do tend to go out the window a little bit.* (E8)

Relatedly, HCPs described how the belief that some behaviours are normative at music festivals can undermine health risk perceptions:



*She'd been found in possession of ecstasy, cannabis and ketamine...She started assaulting the police and they pointed out that they could have done a full possession and she said 'Well, why? Everybody here has got drugs, what difference does it make?'* (E7)

Moreover, most HCPs spoke of how mass gathering attendance constitutes a 'holiday' for many attendees. For music festivals, a sense of fun and freedom from responsibilities may be sought as part of the holiday, motivating risk behaviours that may be less socially acceptable elsewhere:

*A lot of people are up for [unprotected sex]. It's like a holiday...You're surrounded by other people who will want to have a good time.* (E17)

*I've met quite a few people who only smoke at festivals because they live and work in places where you can't smoke, or it's frowned upon, so they do it when it's part of being on holiday.* (E7)

This was seen to be further exacerbated by an increased willingness to engage with novel, potentially risky behaviours, believed to have little consequence for their health:

*"I think you just think ... 'Well, it's okay because I'm here ... I would never do it outside, but I can do it while I'm here'"* (E8).

### ***Normative Pressure***

The following theme describes HCPs' perceptions of how engagement with unhealthy norms may be enforced or encouraged by fellow attendees, both directly and indirectly. Regarding indirect normative pressure, some HCPs suggested that if an attendee is part of a collective engaging in unhealthy norms, they would be motivated to conform:

*There'd be a certain time when it's actually better for you to not carry on drinking or taking drugs, but if it's a whole group of friends...who are*

*continuing to engage in that, then I think that would be a very strong influence for you to carry on. (E10)*

Moreover, adhering to an unhealthy norm may be motivated by perceived pressure to do so:

*I think things like in torrential rain going on a nighttime procession, you're doing that because of the pressure of the group norm. (L1)*

*I've had people give me the drugs and say 'I don't really know, but I felt under pressure.' (E8)*

HCPs further reflected on how attendees may engage with unhealthy norms for reasons of social approval, to fit in with a collective or for fear of being ostracised:

*People feel pressured...about the drug and drink and that, they might choose to do a particular action because they don't want to be left out of the group. (E9)*

*If it's one person out of a car of four who was ill, you're not going to say much to the other three until you're really, really bad...They're not going to be very friendly to you. (E7)*

Hence, HCPs described how attendees may want to experience a shared identity (and the sense of belonging it creates) by conforming to the perceived norms of the event-specific identity, even though it may conflict with personal and/or social values salient outside the mass gathering. Furthermore, the quote from E7 highlights a view shared by several HCPs – attendees may refrain from seeking medical attention in fear of ruining the experience of their collective. The pursuit of social approval was also believed to extend beyond the bounds of the mass gathering:

*They want to have a bit of a tale to tell...They want to get really far at the front, and there's actually a mosh pit, to say you've been there and done it.*

(E9)

*People sometimes see it as a trophy to have got as intoxicated as possible.*

(E10)

Turning to the experience of direct normative pressure, HCPs reported that attendees may actively exert pressure on others to engage with a perceived norm:

*It might be they're in a group and they all do [drugs] together, like a peer pressure thing...Perhaps being encouraged to partake in something that could potentially kill them actually. (E9)*

*'You must come to mass', even though they're not feeling quite so well that day, but they feel that they need to go because their friends are going. I would think there's a little bit of persuasion, definitely 'Come, come, come'. (L2)*

The exerted pressure may not necessarily be carried out maliciously but rather to encourage others to fully enjoy the experience of the mass gathering (i.e., to enact the event-specific identity), as was suggested in relation to Lourdes: *"The lady who wasn't well, they wanted her to go just to be part of it"* (L4).

### ***Navigating Health Risks through Experience***

The preceding themes touched on the importance of experience in navigating mass gathering-associated health risks – nuances of this concept are elaborated further under this theme. HCPs operating at music festivals noted that experience coincides with age, whereas age was often in and of itself referred to as a health complication among HCPs operating at Lourdes. HCPs stressed that not all attendees at music festivals break social

norms or are affected to the same degree by normative pressure – identity shifts and expressions also differ across time and context. HCPs often compared and contrasted the interaction between age, experience, and norms within and between events. Reading was described to foster engagement with alcohol and substance use and was referred to as “carnage” (E13), “a sixth form disco on acid” (E8), and “a massive drinking sleepover” (E6). This was attributed to the young age of attendees and associated (experimental) norms:

*You got young people with little experience of alcohol and drugs trying it out for the first time in the absence of proper supervision, so inevitably it doesn't always go well. (E11)*

Inexperience with alcohol and substance use at Reading was frequently the reason for attendees requiring medical attention. This was understood to be exacerbated by a sense of invulnerability inherent to being young and belonging to a collective: “*You're invincible when you're with friends. The group, the team is going to cope*” (E7). By contrast, seasoned, often older, attendees – typically at Glastonbury and Shambala – were described as more responsible, lessening substance-related (and other) complications prevalent among younger inexperienced attendees: “*Young people actually have to be taught how to have fun because it's not fun when you're lying in the medical centre*” (E7). Although seasoned attendees still engage with health risks, they do so in a risk-aware and regulated manner that enhances as opposed to undermines the mass gathering experience:

*The Glastonbury drug user tends to be a more mature drug user and knows what they're doing. (E8)*

*It doesn't mean that they don't get drunk, but at least they've got more sense of when to stop. (E14)*

## **Perspectives on the Incorporation of Social Identity Processes into Healthcare Practices and Interventions in Mass Gatherings**

This overarching theme focuses on the second aim of the study: exploring HCPs' perspectives on how social identity processes can be drawn upon to inform and improve healthcare practices and interventions in mass gatherings. There was an overall consensus among HCPs about the utility of the approach.

### ***Messages from Leaders and Fellow Ingroup Members***

Several HCPs believed that a shared identity among attendees could be reinforced by 'leadership figures' and that this, in turn, used to mitigate risks:

*If a performer at a mass gathering, if the footballers on the pitch or the bands on the stage are promoting particular ideas, it's going to have a lot more traction than the nanny state, as it's called, telling you to put some sunscreen on and drink less beer and don't take any drugs. (E11)*

Messages from leaders (e.g., pop stars and sports personalities) compared to actors with which recipients do not identify (e.g., event organisers or HCPs) were thought to increase compliance as they are respected and seen as trustworthy: "*Those are the sorts of people they look up to. People like me, I'm just old, I could be somebody's grandma, so it's no use*" (E14). Likewise, messages from peers were suggested as effective:

*If you see people benefiting from doing a certain thing...and you're part of that group, potentially you're going to stand up and listen...Sometimes people will listen to others in a similar situation as opposed to experts. (L4)*

Moreover, messages advocating safeguarding of the collective's wellbeing were seen as a potential avenue:

*It takes one person to be aware of the risks, to put their head above the parapet...and say 'Actually let's not get ourselves into a state, let's have a good time without putting health at risk and look after each other.'* (E16)

### ***Signalling a Shared Identity***

A few HCPs identified that it may be important to bridge the gap between attendees and HCPs by creating a shared identity between them:

*Although we are there to help them...we are still seen as authority figures. Perhaps we shouldn't leave the fairy wings outside, perhaps we should wear them...If you put a name badge on, that means you're official. We always stress that we're not going to get anybody into trouble...but there's that suspicion that we're official.* (E8)

Making salient a shared identity by diminishing the distinguishing characteristics of HCPs (i.e., uniforms or badges) vis-à-vis attendees was believed to have the potential to increase trust and cooperation and thereby facilitating treatment. Attendees presenting with substance-related complications were described as often unwilling to cooperate by disclosing their substance use in fear of 'getting in trouble'. However, in a different mass gathering context (Lourdes), uniforms or badges may encourage attendees to seek help from HCPs:

*My team wear identifiable colours so that anybody on the pilgrimage can spot somebody and actually the pilgrims know the people in the hoodies with our logo on, that they are safe people to ask for help.* (L5)

HCPs stressed that attempts to stop normative risk behaviours completely, such as substance use, are unlikely to be effective. It may instead lead to further resistance towards HCPs, making the distinction between ‘authorities’ (e.g., event organisers and HCPs) and attendees even more salient:

*If you're authority, your goal is nobody takes drugs. I don't think that works because that's going against something that's very normalised within that sort of social group within festivals and I think that would then reinforce that 'us, them' approach. (E13)*

It was suggested that creating a common goal between authorities and attendees (e.g., safer substance use through drug-testing facilities to confirm the contents of drugs) could be effective. Relatedly, a small number of HCPs expressed that although security personnel are typically helpful, they can occasionally undermine the trust and cooperation HCPs attempt to build:

*Some of the patients...have been injured or upset by security. So sometimes the security are the cause of the problems that we get...Maybe it can be kind of helpful to create a bit of a separation between [healthcare professionals] and the police and security. (E12)*

HCPs suggested that this issue could potentially be addressed by highlighting the distinctiveness of their professional role and identity vis-à-vis security personnel and the police.

### ***Focusing on Norms***

Many HCPs believed it to be important to draw on social norms in the design of healthcare interventions:

*Changing behaviours is much more about social norms and social expectations...Try and draw on the shared experience and the idea that 'We festival-goers behave like this, we Man-u supporters behave like this.'* (E11)

Emphasising expected etiquette (i.e., norms) through messages “*about how to behave, how not to behave*” (E9) was identified as a potential avenue. Similarly, it was recognised that there was an opportunity to shape norms through health messages: “*Things like drug-testing, I think that could be something that could be normalised*” (E13). In line with this, going against these norms could be conveyed to result in social disapproval by peers:

*If you turn up sunburnt...people shun you and treat you in a very different way. So it's not messages about 'Put on sunscreen because you won't get skin cancer', it's 'Put sunscreen on because if you don't, it'll go pink and start peeling, all your mates will laugh at you.'* (E11)

### **Survey Findings**

Descriptive statistical analyses were performed to analyse survey data, using IBM SPSS Statistics software (version 24.0); the results are summarised in Table 10. The majority of HCPs agreed or strongly agreed with the survey items (85.88%), further indicating that HCPs perceive value in considering social identity processes in the aggravation and mitigation of mass gathering-associated health risks.



**Table 10***Descriptive Statistics from the Survey Data*

Item	Frequencies (%)					Mean (SD)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
It is important to consider psychological factors in mitigating mass gathering-associated health risks.	0	0	1 (5.9%)	7 (41.2%)	9 (52.9%)	4.47 (.62)
Shared social identity in mass gatherings can encourage attendees to engage in health-impairing behaviours.	0	0	3 (17.6%)	7 (41.2%)	7 (42.1%)	4.24 (.75)
For effective mitigation of health risks in mass gatherings, it is necessary to consider health-impairing effects of shared social identity.	0	0	2 (11.8%)	10 (58.8%)	5 (29.4%)	4.18 (.64)
Healthcare professionals would benefit from receiving information/training on how to mitigate mass gathering-associated health risks by drawing on shared social identity.	0	1 (5.9%)	2 (11.8%)	8 (47.1%)	6 (35.3%)	4.12 (.86)
If I were to provide healthcare in a mass gathering in the future, it would be beneficial for me to receive information/training on how shared social identity can affect health-impairing behaviours.	0	1 (5.9%)	2 (11.8%)	10 (58.8%)	4 (23.5%)	4.00 (.79)

## Discussion

This study aimed to explore HCPs' perspectives on the implications of social identity processes for mass gathering-associated health risks, and how these processes can be drawn upon to inform and improve healthcare practices and interventions. Regarding the first aim, HCPs' accounts highlighted a range of psychosocial factors and processes believed to aggravate health risks. Many, if not most, of these psychosocial factors and processes arguably parallel theoretical tenets formulated by the social identity approach, and empirical evidence in support of these tenets.

The psychosocial factors and processes described by the HCPs pertained to the supportive nature of psychological crowds (e.g., see Hopkins et al., 2016), engendering acceptance of health risk behaviours and a desire to enhance a shared identity through risk-taking and endurance. This observation resonates with theory and research demonstrating that the accentuation of trust and support emanating from sharing a social identity in mass gatherings undermines health risk perceptions and behaviours (Cruwys, Greenaway, et al., 2020; Hopkins & Reicher, 2016a, 2016b, 2017). HCPs also described that engagement with health risks may serve to express and affirm identities and a sense of freedom. This is in line with research situated in mass gathering and other settings demonstrating that engagement with health risks may serve to express and affirm social identities (Oyserman et al., 2007), and a sense of freedom – or escapism, as suggested by Hutton et al. (2018). This transformation has been referred to as 'collective self-realisation' (CSR) – the ability to enact a social identity in a mass gathering – and is a source of positive affect and empowerment (Drury et al., 2005; Hopkins et al., 2016). Yet, when enactment is entwined with normative shifts and associated pressures towards engagement with health risks, CSR may constitute a 'social curse' (i.e., when group memberships harm health; C. Haslam et al., 2018).

Furthermore, HCPs described that engagement with health risks can be motivated by both direct and indirect normative pressure. This observation arguably corresponds to research findings from non-mass gathering contexts showing that norms exert the greatest influence when people share a social identity (Louis et al., 2007), and are followed to express and affirm group affiliation (Cialdini & Goldstein, 2004); group members may, in turn, pressure and feel pressured by other group members to conform (Johnston & White, 2003; Livingstone et al., 2011). Finally, HCPs described that more experienced attendees adopt more risk-averse strategies that optimise identity enactment and its positive effects (Drury et al., 2005; Hopkins et al., 2016) – research has indeed shown that risk-awareness and regulation develop through experiencing and witnessing adverse effects of engagement with health risks (e.g., Beaulieu et al., 2020).

Turning to the second aim of the study, HCPs suggested that health messages disseminated by sources with which attendees may perceive a shared identity, both leaders (e.g., performers and religious leaders) and peers, as opposed to ‘authorities’ (e.g., event organisers or HCPs), could increase source credibility and thereby compliance. Second, and along similar lines, fostering trust and creating common goals by making salient a sense of shared identity between attendees and HCPs (or other event authorities) was believed to facilitate adherence to health messages and treatment. These suggestions resonate with the social identity approach, which posits that perceptions of authorities’ legitimacy are entwined with a shared identity; compliance can be increased by developing a shared identity with authorities (e.g., at mass emergencies and football events; Carter et al., 2020; Stott et al., 2020). Research from non-mass gathering settings has also shown how trust in authorities increases compliance with health policies and messages (Blair et al., 2017), whereas the lack of trust has the opposite effect (Alsan & Wanamaker, 2017). People with which one shares

a social identity are more likely to be perceived as trustworthy and credible and, in turn, persuasive, even when they are strangers (Cruwys et al., 2021; Platow et al., 2012; Turner, 2005). Similarly, leaders who are viewed as prototypical of the group ('one of us'), acting in the interest of the group, and who propagate a sense of shared identity ('we are all in this together') exert greater influence (e.g., see S. A. Haslam et al., 2011). Third and finally, HCPs suggested that health messages that define norms and highlight social consequences of norm violations could be useful (e.g., getting sunburnt by neglecting to use sunscreen). This again reflects research showing that norms exert the greatest influence when people perceive a shared social identity and that social disapproval can increase conformity (Nelissen & Mulder, 2013). Hitchings et al. (2018) reported that music festival attendees who reflected on hygiene anxieties tended to regard social disapproval of their unhygienic behaviour as a greater concern than the physiological sensation of poor hygiene.

### **Implications and Future Directions**

The findings highlight common ground and understanding between social identity theorists and HCPs about how social identity processes can aggravate and mitigate engagement with health risks in mass gatherings. This understanding can potentially pave the way for future collaborations aimed at furthering knowledge about the implications of social identity processes for health risks, and devising practices and interventions that draw on social identity processes to manage health risks. The translation of the social identity approach into policy and practice to manage other salient mass gathering specific risks, such as disorder and violence in football crowds (Stott et al., 2020) and evacuations during mass emergencies (Carter et al., 2018), have already proven effective. We believe that the same can be the case for the management of health risks in mass gatherings.

The key to managing health risks, and ensuring health, safety, and wellbeing in mass gatherings, lies in devising practices and interventions that are perceived as legitimate within a given mass gathering context. Legitimacy is, in turn, predicated upon an understanding of how mass gatherings involve the enactment of social identities. What social identity enactment exactly involves will differ from mass gathering to mass gathering, and it is particularly important to give this variability, or arguably specificity, close attention. If every mass gathering involves the enactment of a particular set of identities, it may also involve engagement with a particular set of health risks.

Healthcare practices and interventions that are effective, or in other words perceived as legitimate, therefore need to take into account how and what cognitions, emotions, and behaviours are transformed and intertwined with identity enactment in a given mass gathering context. Moreover, and importantly, social identity enactment has implications for how groups define themselves in relation to other groups, whether it be supporters of rival football teams, the police force, emergency responders, or healthcare professionals. This makes it particularly important that healthcare practices and interventions are devised in a way that supports and enhances, rather than undermines, identity enactment. Attempts to completely prevent attendees from engaging in risk behaviours perceived as integral to identity enactment may be perceived as illegitimate and met with resistance and even resentment, rendering them ineffective. At the most basic level then, HCPs (and other authorities) operating in mass gatherings would benefit from receiving training about crowd psychology, with a focus on how health risks are implicated in social identity processes. However, it is important not to overlook the insights offered by HCPs as a basis for future research. More specifically, the accounts of the HCPs in this study point to the necessity of paying closer attention to the nature of normative pressures that may arise from social-relational transformations integral to

identity enactment, and how engagement with health risks may both enhance and undermine the positive effects of mass gathering participation. The findings also suggest that efforts to improve healthcare practices and interventions should focus on examining the effectiveness of promoting health messages by invoking shared identities, values, norms, and goals.

These findings are also of relevance for understanding and managing collective behaviour during the ongoing COVID-19 and future pandemics. They demonstrate the effectiveness of communicating health messages aimed at curtailing transmission of the virus through trusted leaders and ingroup members, with an emphasis on the shared goal of protecting the collective. For examples of a social identity perspective on COVID-19, see Cruwys et al. (2021) and Jetten et al. (2020).

### **Limitations**

Even though the HCPs who participated in the study had experience providing healthcare in a range of mass gatherings, the sample was self-selected, and their perspectives do not reflect the full spectrum of mass gathering contexts. There was also a smaller number of HCPs from the Lourdes team compared to EMP teams – the general focus on alcohol and substance use in the findings arguably reflects this asymmetry. Yet, this limitation further underlines the necessity of adapting health practices and interventions to specific mass gathering contexts and identities. In contrast to the EMP teams, the HCPs from the Lourdes team focused on religious rituals and frailty-related risks. For example, had HCPs providing healthcare at football events been interviewed, there may have been a greater focus on inter-group violence and excessive consumption of alcohol and unhealthy food (Hutton et al., 2013). Finally, it is important to reflect on some epistemic gaps left by our approach to this research (see Simandan, 2019). There are certainly other psychosocial factors and processes that

affect health risks in mass gatherings that were not explored and HCPs, therefore, did not articulate in this research. These can be, and have been, unearthed with alternative theoretical and methodological approaches (for examples, see Hutton et al., 2013, 2018, 2020). Furthermore, the HCP perspectives offered in this research, and research into mass gatherings and health risk behaviours guided by the social identity approach to date, do not attend directly to the motives that mass gathering attendees themselves, in their own language, ascribe to their engagement with health risks.

### **Conclusion**

HCPs recognised that the social-relational transformations that occur in psychological crowds may undermine health risk perceptions and behaviours – pointing to a range of social identity processes reflected in theoretical tenets and empirical evidence in support of the social identity approach. HCPs also perceived value in drawing on these processes to inform and improve healthcare practices and interventions. The findings further highlight that understanding the identities of crowds is central to the management of health risks and ensuring safer mass gathering experiences.

## **Reflexivity**

Before concluding this chapter, it is essential to critically reflect on the conduct of this qualitative study, from a first-person perspective. The goal is to identify and reflect on the ways in which my (and my participants') standpoint has shaped the research process and findings, typically referred to as 'reflexivity' (e.g., see D'Cruz et al., 2007; Dodgson, 2019). Although the analysis of the data is entirely based on its content, it would be naïve to assume that I as a researcher can fully separate myself from my theoretical background, experiences, personal views, and aspirations in the process of conducting the research. Despite that this was a deductive study guided by the social identity approach – which I hope to have been transparent about – this research approach may be associated with several key issues that I will reflect upon.

First, how I construct and understand social identity and related processes may be entirely different to that of my participants. This may have influenced the meanings I ascribed to participants' responses in favour of my understandings grounded in the social identity approach. I may unwittingly have imposed my understandings and, in doing so, misrepresented the participants' lived experiences and perspectives. However, I was conscious about this caveat during the interviews and the analysis. I therefore made every effort to avoid imposing my understandings on what the participants communicated. For example, I engaged in active listening during the interviews, including paraphrasing and reflecting back what the participants said to ensure I had correctly understood the meanings ascribed to what they had shared. My supervisors also checked my analysis of the data to ensure credibility and researcher triangulation.

Second, HCPs are extremely busy tending to patients and therefore, presumably, do not have time to or are concerned with reflecting on the social aspects underpinning health risk behaviours. The HCPs' priorities are to treat the aftermath of these behaviours



rather than to prevent them. Asking participants to reflect on how social identity processes are implicated in the aggravation and mitigation of mass gathering-associated health risks may thus have been a stretch and of little interest to the participants.

Third, the design of the interview schedule may have introduced bias. How the questions and instructions were phrased may have led the participants to agree that social identity processes were at play in mass gatherings and undermining health risk perceptions and behaviours. When I designed the interview schedule, I was concerned about creating a schedule that focused on what we already know and what we think is transpiring in mass gatherings, in an accessible and directive manner, but still using social identity terms (or perhaps jargon). In hindsight, it may have been a better approach to give the participants freer reign and not use social identity jargon or refer to the implications of social identity for social relations and behaviour. This is potentially a serious and widespread issue that may need to be reviewed in the social identity literature in general; it is not uncommon to describe what social identity is and entails, prior to or during the interview, to ensure the participants are on the same page (e.g., Tarrant et al.'s (2017) study informed the design of the interview schedule used in this study). It may even be considered necessary to discuss the complex processes at play to ensure the participants understand what the study seeks to address.

I would argue that, from an ethical standpoint, it is essential to ensure that participants are fully aware of the foundations of the research and its agenda to be able to make an informed decision about whether to take part in the research or not. Explaining the psychological processes, related jargon, and central findings is key to this. If participants feel strongly about or disagree with the research focus and research questions, it might even act as an incentive to participate and have their voice heard – either to confirm or disconfirm (or neither) the research focus. Regardless, I wholly

acknowledge that there is a fine balance between designing leading questions and providing participants with sufficient information about the research. This is a practice I will strive to perfect in any future research endeavours.

Fourth, following on from the point above, perhaps one of the greatest underlying threats to the validity of qualitative research is the interviewer-interviewee relationship. That is, “the asymmetrical power relations of the research interviewer and the interviewed subject” (Kvale, 2002, p. 9). I, as the interviewer, initiated the interview and determined its theme, posed the questions, and terminated the interview. There is therefore no question that there is not an equal power relationship in interviews, which may even contribute to social desirability bias (i.e., interviewees provide responses to ‘please’ the interviewer; see Collins et al., 2005). However, the participants were healthcare *professionals* – most of which were much older than me and who possessed many years of experience providing healthcare in mass gatherings. By contrast, I was in this context somewhat of a novice and a ‘researcher in training’, with comparatively very little prior understanding of health risk perceptions and behaviours in these settings. Considering this, I believe it is unlikely that I exerted a problematic persuasive influence on the participants. Moreover, in welcoming the participants and explaining the interview process, I stressed how important it was for me to gain insight into *their* experiences and *their* understandings of the research topic, and I encouraged them to be open and honest when responding to the questions. At the end of the interview, I also asked participants if there was anything they wished to add upon reflection of what we had spoken about during the interview or if there was anything they would like to change in terms of their previous responses. This, of course, is no guarantee that the participants felt reassured and therefore did not provide ‘socially desirable’ responses,

but I hope to, with this practice, have been as open and transparent in the research process as possible.

Finally, I have attended many music festivals and ‘gigs’ in my lifetime, and I acknowledge that this has inevitably biased my views about what transpires, on a social spectrum, in mass gatherings and particularly music festivals. For example, I have observed that people often help strangers on the camping sites (e.g., share resources), hug strangers, and challenge their friends to consume more alcohol. Conversely, I sought to capitalise on these preconceptions in the conduct of the interviews by probing interviewees about phenomena I have experienced alongside probing based on previous social identity research and theoretical accounts. The interviewees then either confirmed or disconfirmed these preconceptions and I was conscious of not analysing and presenting their responses in a way that would omit responses that did disconfirm my preconceptions and those grounded in the social identity approach.

## **CHAPTER 8: General Discussion**

### **Chapter Overview**

This final chapter concludes the thesis. It begins by revisiting the aims of the thesis and methodological approaches used to address these aims, followed by a summary of the research findings. The implications of the research and its limitations are then discussed, and recommendations for future research are provided. The chapter closes with an overall concluding statement of the research.

### **Review of the Aims of the Research**

This thesis sought to examine the aggravation and mitigation of mass gathering-associated health risks from a social identity perspective – drawing on both the social identity approach to health and crowd psychology. The specific aims of the thesis were: (a) to identify existing knowledge and research gaps and thereby directions for future research concerning the relationship between social identity processes and mass gathering-associated health risks; (b) to provide empirical evidence of the theorised negative relationship between a shared social identity and health risk perceptions and behaviours in mass gatherings; and (c) to explore how health interventions aimed at mitigating mass gathering-associated health risks can be improved by drawing upon social identity processes.

Mass gathering-associated health risks have traditionally been understood in terms of physical factors (i.e., environmental and biomedical factors), disconnected from the psychosocial domain of mass gathering events (Arbon, 2004, 2007; Hopkins & Reicher, 2016a; World Health Organization (WHO), 2015). Efforts to mitigate health risks have, accordingly, centred around physical means. It is not until relatively recently the psychosocial aspect of collective participation, and its implications for perceptions and behaviours, has received attention as a potential driving factor concerning negative

health outcomes in mass gatherings (e.g., see Hutton et al., 2011, 2013, 2018, 2020). One of the priority areas of focus for the WHO (2015) has indeed recently become psychosocial factors and their importance in the development and implementation of interventions to mitigate mass gathering-associated health risk. However, existing research, and the field of mass gathering medicine, is theoretically underdeveloped (i.e., it does not offer a theoretical explanation). It is in need of a psychological framework to advance understanding of the psychosocial factors underpinning negative health outcomes in these contexts, and the role of psychosocial factors in mitigating risks (Hopkins & Reicher, 2016a, 2016b, 2017; Memish et al., 2019; Steenkamp et al., 2016; Yezli et al., 2018).

The social identity approach (Tajfel & Turner, 1979; Turner et al., 1987) offers a psychological framework for understanding health and crowd behaviour. The ‘social cure’ literature has demonstrated how social identification and related processes positively affect health outcomes, in small group settings and mass gatherings alike. Likewise, the ‘social curse’ literature demarcates the health-impairing influences of social identification and related processes in small group settings (C. Haslam et al., 2018; S. A. Haslam et al., 2009, 2018; Jetten et al., 2012; Wakefield et al., 2019), but whether the social curse also operates in mass gatherings is unclear and necessitates empirical investigation (Hopkins & Reicher, 2016a, 2016b, 2017). The outlined neglect of the importance of psychosocial factors in the aggravation and mitigation of mass gathering-associated health risks and limited research concerning the social curse in mass gatherings motivated the undertaking of the research presented in this thesis.

### **Summary of Research and Findings**

To address the aims of the thesis, a mixed methods approach, underpinned by pragmatism, was adopted to gain a comprehensive perspective of the research topic and

to allow for flexibility in the line of research inquiry. This thesis encompassed five empirical studies. The studies and their key findings are summarised below, and even more briefly in Table 11 at the end of the following summarising sections.

### **Study 1: A Systematic Review**

The programme of research began with a mixed methods systematic review of the literature (Chapter 4). The review was carried out to synthesise and evaluate existing evidence of the (so far theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gatherings. Hopkins and Reicher (2016a, 2016b, 2017) provided theoretical accounts, grounded in self-selected literature, of this relationship and it was therefore also of interest to determine whether these accounts had spurred research within the topic area, through a systematic method. In relation to the thesis, the review served to identify (proximally related) processes that may underpin the theorised relationship and, if the evidence base indeed was limited, it would justify the undertaking of the programme of research.

Four key electronic databases were systematically searched using a developed search strategy leading to the identification of 142 articles, of which three were quality appraised and included in the review after full-text screening. A narrative synthesis, drawing on the principles of thematic analysis, of the included articles was performed and grouped the included articles into two themes: ‘A sense of safety’ and ‘Risky group norms’.

One of the included articles categorised under ‘A sense of safety’ concerned the role of social identification in crowd safety among Hajj pilgrims and involved a field-based cross-sectional survey (Alnabulsi & Drury, 2014). A key finding of this study was that pilgrims who highly identified with the crowd perceived increased safety with greater

crowd density because they believed that others in the crowd were supportive and expected their support. The second included article in this theme involved a retrospective questionnaire and interview study that examined the relationship between social identification and resilience in a near disaster (music) event. The questionnaire data revealed that identification with the crowd positively predicted feelings of safety through expectations of help from other attendees. The qualitative data highlighted how crowd safety professionals perceived the crowd as disorderly and felt they had lost control. In contrast, attendees did not perceive disorder as representative or prominent but agreed that the professionals had lost control – yet they did not feel that their safety was diminished because of this, which may have been a corollary of the positive atmosphere in the crowd.

One article, involving two quantitative studies, was included in the theme ‘Risky Group Norms’ and focused on the mental health impact of attending a mass gathering for school-leavers (Cruwys et al., 2019). The findings indicated that mental health improved over time among attendees who highly identified with others and experienced the event as an enactment of a valued social identity. By contrast, socially isolated attendees, or those who lacked a sense of social identification, experienced more psychological distress and believed that risk-taking was normative and perceived dangerous behaviours to be less risky. This indicates that a lack of social identification can evoke beliefs about risky norms. However, in the systematic review, an alternative interpretation of the findings, not offered by the authors of the article, was presented: socially isolated attendees, or those who do not experience a sense of shared identity, may endorse and engage in risk behaviours perceived to be normative to signal affiliation and, in turn, gain social approval.

Taken together, the articles included in the review indicate that health risk perceptions may be lowered because of expectations of social support through the experience of a sense of shared social identity. That is, event attendees may experience a false sense of safety in a hazardous situation (i.e., not perceive a risk to pose a risk) because they expect others in the crowd, with which they identify, to act in a supportive manner towards them. Moreover, attendees who lack a sense of shared social identity may endorse and engage in risk behaviours perceived to be normative – possibly in the pursuance of a sense of shared social identity.

Importantly, the systematic review highlighted that none of the included articles explicitly or directly investigated the relationship between social identification and health risk perceptions and/or behaviours in mass gatherings. Still, they highlight two corollaries (i.e., a false sense of safety and perceiving risk-taking to be normative). Through this systematic review, it was possible to conclude that there is a lack of empirical evidence for the (theorised) negative relationship between social identification, despite the calls for action from both the WHO (2015) and Hopkins and Reicher (2016a, 2016b, 2017). This paved the way for the programme of research presented in this thesis. Furthermore, the review highlighted the need for research exploring different types of mass gatherings, given the likely variations in norms and values (and prominent health risks) associated with different events. It was also argued that future research should seek to corroborate the processes identified in the review and unearth additional processes underlying the (theorised) negative social identity-health risk relationship. To this end, as suggested in the review, research may not necessarily be field-based. Rather, future research could, for example, take an experimental stance to provide ‘proof-of-concept’ evidence and, in line with Drury et al.’s research (2015), garner the perspectives of not only event attendees, but also of



those involved in the planning, maintenance, and medical services in mass gatherings.

Study 2-5 of this thesis followed up on these points.

### **Study 2 and 3: An Experimental Vignette Study and a Cross-sectional Survey**

#### **Study**

Having provided a (systematic review-supported) justification for the programme of research, the next goal was to provide ‘proof-of-concept’ empirical evidence in support of the theorised negative relationship between social identification and health risk perceptions in mass gatherings (and its underpinnings). Chapter 5 presented the second and third empirical study of the thesis, which aimed to examine how experiencing a sense of shared social identity in mass gatherings impacts on health risk perceptions.

Study 2 employed a retrospective experimental vignette design wherein participants read a description of social identification and physical versus psychological crowds. They were then asked to recall either a physical or psychological crowd of which they had been part and completed measures assessing shared social identity, health risk perceptions, and disgust in relation to the recalled crowd. These measures were adapted based on previous measures to suit the mass gathering context or developed because of the lack of appropriate measures. The dimensionality of each measure was examined through principal components analyses, and a MANCOVA and indirect effects analyses were computed to test for differences in health risk perceptions between the conditions and mediation by disgust. The results revealed that participants who recalled a psychological crowd (i.e., perceived a shared social identity) reported lower perceptions of disgust and health risks and that the effect of sharing a social identity on lowered health risk perceptions was mediated by lowered perceived disgust.

For triangulation of data and results, and to examine a *specific* type of mass gathering event in the *recent* past, Study 3 employed a cross-sectional survey (comprising the same measures as Study 2) and recruited event attendees of recent music festivals (within four weeks of completing the study). Mediation analyses were performed to test if the relationship between shared social identification and health risk perceptions was mediated by disgust. The results corroborated those of Study 2; perceived disgust mediated the relationship between greater shared social identification and lowered health risk perceptions.

Together, the studies provided ‘proof-of-concept’ evidence for the negative relationship between social identification and health risk perceptions in mass gatherings, and a process by which it is underpinned – disgust. They showed that mass gathering event attendees who experienced a sense of shared social identity exhibited lowered health risk perceptions because they also perceived less disgust. More specifically, the perception of a shared identity had an indirect effect on increasing the likelihood of engagement with risky behaviours and reducing the perceived risk of engagement (e.g., sharing a water bottle or physically supporting a fatigued crowd member displaying flu-like symptoms) via lowered disgust. Likewise, there was an indirect effect of shared identity, via lowered disgust, on reducing the extent to which participants judged themselves vulnerable to disease transmission. However, Study 2 and 3 only tested disgust as a mediator of the relationship between social identification and health risk perceptions in mass gatherings. As argued in Chapter 5 (and the following two chapters), to gain a better understanding of the social identity (and related) processes at play in mass gatherings, and their implications for health outcomes, further theorising and research is needed – particularly since the thesis also sought to consider how social identity processes may be incorporated in health interventions in mass gatherings.

#### **Study 4: A Systematic Scoping Review**

Chapter 6 presented a mixed methods systematic scoping review of the literature. The review was conducted to identify additional social identity processes that may implicate health outcomes in mass gatherings that have been overlooked or not considered in existing theoretical accounts and research, and to inform the design of future research. Unlike Study 1, this review examined the implications of social identity processes for health risk perceptions and behaviours in *non-mass gathering* settings (i.e., any setting other than mass gatherings). The specific aims of the study were to: a) provide a comprehensive overview of the research on the negative implications of social identity processes for health risk perceptions and behaviours in non-mass gathering settings; and b) consider how reviewed social identity processes may generalise to mass gathering settings.

A systematic search was carried out in four major databases. The search led to the identification of 1751 articles, of which 90 articles were included after full-text screening and quality appraised. A narrative synthesis, drawing on the principles of thematic analysis, of the included articles was performed. Four main themes with four sub-themes were identified: 1) Peer crowd identification as a health-impairing and health-protective factor (sub-themes: Conformist and non-mainstream identities and Sports-related identities); 2) Minority group identification as a health-impairing and health-protective factor (sub-themes: Ethnic, racial, and cultural identities and Non-heterosexual identities); 3) Fitting in: social pressure and affirming a distinct social identity; and 4) Theoretically discordant findings.

The review elucidated how merely identifying with social groups can shape health perceptions and behaviours in non-mass gathering settings and that this relationship is complex and dependent on the types of social identities and their social contexts. Some

identities were consistently associated with health-impairing perceptions and behaviours (e.g., student identity and alcohol consumption), whereas others were consistently associated with health-protective perceptions and behaviours (or both simultaneously; e.g., 'jocks' engaging in excessive alcohol consumption but not drug use). Very few of the included articles examined (social identity) processes or mechanisms underlying the social identity-health risk relationship but those that did focused on norms – not necessarily from a social identity perspective. Hence, the findings were interpreted and explained in terms of social identity and self-categorisation processes.

In brief, the interpretation of the findings from the lens of the social identity approach highlighted that an overarching process that underlies the social identity-health risk relationship pertains to unhealthy group norms. This overarching process can further be divided into two 'sub-processes': normative pressure and identity affirmation.

Perceived norms motivate engagement in health risk behaviours because people feel pressured to engage in the norms or because engagement in the norms is a mean to affirm their identities. The processes by which people engage in unhealthy norms are influenced by the social context; there may be greater normative pressure to engage in health risk behaviours (perceived to be normative) for some social identities in some contexts, and health risk behaviours may also be more central prototypical attributes of some social identities. Moreover, meaning ascribed to a given social identity is key because it defines what is viewed as normative or non-normative. Health risk behaviours may be more identity-defining for some social identities because of social context, which involves not only immediate social comparative context, but also broader historical, cultural, and political context and processes. Because of the same

contextual processes, it is more important for some social groups that members embody central prototypical characteristics, including engagement with health risk behaviours.

The potential implications of the identified processes for health risk perceptions and behaviours in mass gatherings were considered. This included highlighting how some mass gathering-identities may be particularly associated with unhealthy norms (e.g., electronic dance music festivals and substance use) and that mass gatherings involve not only superordinate identities but also sub-identities – each associated with specific (unhealthy) values and norms. For example, substance use at music festivals may be identity-defining and may even be motivated by a desire to achieve identity distinctiveness. The role of normative pressure in mass gathering-associated health risks was also considered. For example, some attendees may feel pressured to engage in health risk behaviours perceived to be normative to display prototypicality or pressure others to engage in these behaviours because they are viewed as central prototypical attributes of the group. Furthermore, it may be particularly important for some social identities in mass gatherings to subscribe to central prototypical characteristics (including unhealthy behaviours) to achieve identity distinctiveness and thereby a positive identity. This illuminates the importance of considering the variations in normative understandings regarding health risk perceptions and behaviours depending on the involved social identity and the social context of the mass gathering.

Overall, the review contributed to synthesising the disparate literature, highlighting the negative social identity-health risk relationship and underpinning processes in both non-mass gathering and mass gathering contexts. That is, it advanced understandings of the implications of social identification for health risk perceptions and behaviours, led to the identification of social identity processes (i.e., normative pressure and identity affirmation) that may implicate health risk perception and behaviours in mass

gatherings and thus offered guidance for future research; it provided a starting point for investigations focused on how social identity processes may not only aggravate mass gathering-associated health risks but also how social identity processes may be drawn upon to mitigate risks. Exploring how mass gathering-associated health risks can be mitigated through the use of social identity processes was a primary objective in the following, and final, study of the thesis.

### **Study 5: A Qualitative Interview Study**

The final empirical chapter of this thesis, Chapter 7, presented a qualitative interview study with mass gathering healthcare professionals (HCPs), which concluded the programme of research. The study approach enabled elaboration upon and contextualisation of the negative social identity-health risk relationship in mass gatherings (a Catholic pilgrimage in France and music festivals in the UK), established and theoretically reviewed in the previous studies of the thesis; it sought to build upon and extend these studies through a qualitative exploratory approach. The specific aims of the study were to explore the perspectives of HCPs on implications of social identity processes for mass gathering-associated health risks and how social identity processes can be drawn upon to inform and improve healthcare practices and interventions.

Semi-structured interviews with HCPs with experience of providing healthcare in mass gatherings (specifically the Lourdes pilgrimage and large UK music festivals) were conducted. The HCPs also completed a brief survey. A primarily deductive thematic analysis, with inductive elements, was carried out to analyse the interview data, whereas the survey data were analysed using descriptive statistics. Two overarching themes with five and three sub-themes respectively were identified: Perspectives on social identity processes and health risks in mass gatherings (sub-themes: The manifestation of a shared identity, Identity shifts and expressions, Breaking social

norms, Normative pressure, and Navigating health risks through experience) and Perspectives on the incorporation of social identity processes into healthcare practices and interventions in mass gatherings (sub-themes: Messages from leaders and fellow ingroup members, Signalling a shared identity, and Focusing on norms).

In the first overarching theme, HCPs described a range of psychosocial factors and processes believed to aggravate health risks – most of which arguably parallel theoretical tenets formulated by the social identity approach and empirical evidence in support of these tenets. HCPs spoke of how attendees (typically) shift to a salient social (mass gathering) identity, shaping health-related behaviours, and that they are united by the hardships of the event. Mutual social support was described as normative and an expectation but that this positive atmosphere can increase acceptance of risk behaviours. They also recognised that some sub-identities within events have stronger associations with unhealthy norms than others and that engagement in health risk behaviours may be part and parcel of identity enactment (i.e., to express or affirm a social identity) and a desire to experience a sense of freedom in a supportive environment. However, some attendees were thought to experience or exert normative pressure on others to engage in health risk behaviours. That is, some may feel pressured to engage in health risk behaviours that are perceived to be normative (e.g., for reasons of social approval, including signalling affiliation to fit in with a group). Attendees may also actively exert pressure on others to engage in the behaviour – not necessarily malevolently but rather to ensure that others can enact their social identity and associated values and norms. Finally, HCPs observed how more experienced attendees adopt more risk-averse strategies that optimise identity enactment and its positive effects.

In the second overarching theme, HCPs expressed value in drawing on social identity processes to inform and improve healthcare practices and interventions and suggested multiple means to this end. It was suggested that health messages could be disseminated from (prototypical) leaders and fellow ingroup members (i.e., people with which attendees identify and trust, rather than ‘outgroups’). HCPs also believed that it is important to signal and create a shared social identity between HCPs (and other ‘authorities’; e.g., by creating common goals) and attendees to elicit trust and cooperation and that caution should be taken not to impinge on norms perceived as integral to the mass gathering and identity enactment. Finally, HCPs discussed the potential of drawing on norms in the design of healthcare interventions to mitigate health risk behaviours; expected etiquette (i.e., norms) could be emphasised in health messages and engagement in healthy norms could be promoted. Moreover, violating (healthy) norms could be conveyed to lead to social disapproval from ingroup members, invoking a sense of normative pressure. The findings from the survey corroborated the qualitative findings, further indicating that HCPs perceive value in considering social identity processes in the aggravation and mitigation of mass gathering-associated health risks.

Overall, the findings suggest that HCPs recognise that processes, such as norms and identity enactment, are implicated in mass gathering-associated health risks and perceive value in drawing on social identity processes to inform and improve healthcare practices and interventions. The study contributed to both corroborating previously identified processes and unearthed additional key processes that may be implicated in the aggravation and mitigation of mass gathering-associated health risks, in two contrasting mass gathering settings. Taken together, the research highlighted avenues for future research and collaboration aimed at developing healthcare practices and



interventions, informed by the social identity approach, to manage health risks in mass gatherings.

**Table 11**

*A Summary of Aims, Purpose, and Findings of the Thesis Studies*

Study	Key Findings
<p><i>Study 1:</i> A mixed methods systematic review.</p> <p><i>Aim:</i> To synthesise and evaluate existing evidence of the (theorised) negative relationship between social identification and health risk perceptions and behaviours in mass gatherings and identify new studies within the topic area since the publications by Hopkins and Reicher (2016a, 2016b, 2017).</p> <p><i>Purpose in the thesis:</i> Identify important processes and justify the thesis research.</p>	<p>Narrative synthesis, informed by thematic analysis principles, of three articles highlighted that the articles did not explicitly or directly examine the relationship; however, two corollaries of a shared identity may be implicated in this relationship – a false sense of safety and perceiving risk behaviours to be normative. The relevant literature is still in an emerging phase.</p>
<p><i>Study 2 and 3:</i> An experimental vignette study and a cross-sectional survey study.</p> <p><i>Aim:</i> To examine how experiencing a sense of shared social identity in mass gatherings impacts on health risk perceptions.</p> <p><i>Purpose in the thesis:</i> Provide empirical ‘proof-of-concept’ evidence of the theorised relationship.</p>	<p>MANCOVA and mediation analyses revealed that experiencing a shared social identity with other crowd members lowered health risk perceptions; this effect was indirect and mediated via perceived disgust.</p>

**Table 11** (continued)

Study	Key Findings
<p><i>Study 4:</i> A mixed methods systematic scoping review.</p> <p><i>Aim:</i> To provide a comprehensive overview of the research on the negative implications of social identity processes for health risk perceptions and behaviours in non-mass gathering settings and consider how reviewed processes may generalise to mass gathering settings.</p> <p><i>Purpose in the thesis:</i> Inform theorisation about important social identity processes for future research.</p>	<p>Narrative synthesis, informed by thematic analysis principles, of 90 articles illuminated how the negative social identity-health relationship is underpinned by engagement with unhealthy norms brought about by normative pressure and the affirmation of social identities.</p>
<p><i>Study 5:</i> A qualitative interview study.</p> <p><i>Aim:</i> To explore the perspectives of healthcare professionals on implications of social identity processes for mass gathering-associated health risks and how social identity processes can be drawn upon to inform and improve healthcare practices and interventions in mass gatherings.</p> <p><i>Purpose in the thesis:</i> Further examining previously identified processes and unearthing additional processes.</p>	<p>Thematic analysis discerned two overarching themes with five and three sub-themes, respectively: (1) Perspectives on social identity processes and health risks in mass gatherings (sub-themes: The manifestation of a shared identity, Identity shifts and expressions, Breaking social norms, Normative pressure, and Navigating health risks through experience); and (2) Perspectives on the incorporation of social identity processes into healthcare practices and interventions in mass gatherings (sub-themes: Messages from leaders and fellow ingroup members, Signalling a shared social identity, and Focusing on norms).</p>

## **Implications**

The findings from the programme of research presented in this thesis have multiple theoretical, methodological, and policy and practice-related implications – these will be discussed, in turn, below.

### **Theoretical and Methodological Implications**

The research presented in this thesis is novel in (empirically) applying social psychological theory, specifically the social identity approach (Tajfel & Turner, 1979; Turner et al., 1987), to advance the understanding of the aggravation and mitigation of mass gathering-associated health risks from a psychosocial perspective – a priority area of research for the WHO (2015) given the neglect, yet importance, of research concerning the psychosocial domain of mass gatherings. The findings that emerged from this body of research have made several important contributions. Most importantly, this research has built and elaborated upon the existing literature rooted in the social identity approach to both health and to crowd psychology (e.g., C. Haslam et al., 2018; S. A. Haslam et al., 2018; Hopkins & Reicher, 2016a, 2016b, 2017; Jetten et al., 2012; Reicher, 2001, 2012, 2017; Wakefield et al., 2019). The research thus not only makes a unique contribution to the ‘social cure’ and ‘social curse’ paradigm by examining its application to crowd psychology but also to crowd psychology by examining the negative health implications of collective participation.

The findings from Study 1 (a systematic review) demonstrate that the literature concerning social identification and health risk perceptions and behaviours in mass gatherings is still underdeveloped, despite calls for action concerning research directions and health interventions (e.g., see Hopkins & Reicher, 2016b, 2016a, 2017; WHO, 2015). To this end, this thesis lends support to Hopkins and Reicher’s (2016a, 2016b, 2017) theoretical accounts concerning the negative implications of social

identity (and related) processes for health in mass gatherings and expand upon these theorisations. On the whole, the research has elucidated that the social curse also operates in mass gatherings (see Study 2, 3, and 5 – an experimental vignette, cross-sectional survey, and qualitative interviews) – a phenomenon that has previously only been empirically studied in small group settings and often concerning unhealthy group norms (e.g., Kellezi & Reicher, 2012; Tarrant & Butler, 2011; Wakefield et al., 2019).

The findings thus provide empirical proof-of-concept evidence for the negative social identity-health risk relationship in mass gatherings and demonstrate that lowered disgust is an underlying mechanism in this relationship (see Study 2 and 3). This extends previous research in small group settings that has shown the attenuating effect of social identification on the disgust response and research that has linked disgust sensitivity to heightened health risk perceptions (see Karg et al., 2018; Reicher et al., 2016). This indicates that disease transmission may be aggravated because of a lowered defence mechanism against pathogens among attendees who experience a sense of shared social identity (e.g., through increased resource sharing practices; Curtis et al., 2011; Fan & Olatunji, 2013; Pellerin & Edmond, 2013; Rafiq et al., 2009; Rashid & Shafi, 2006; Reicher et al., 2016).

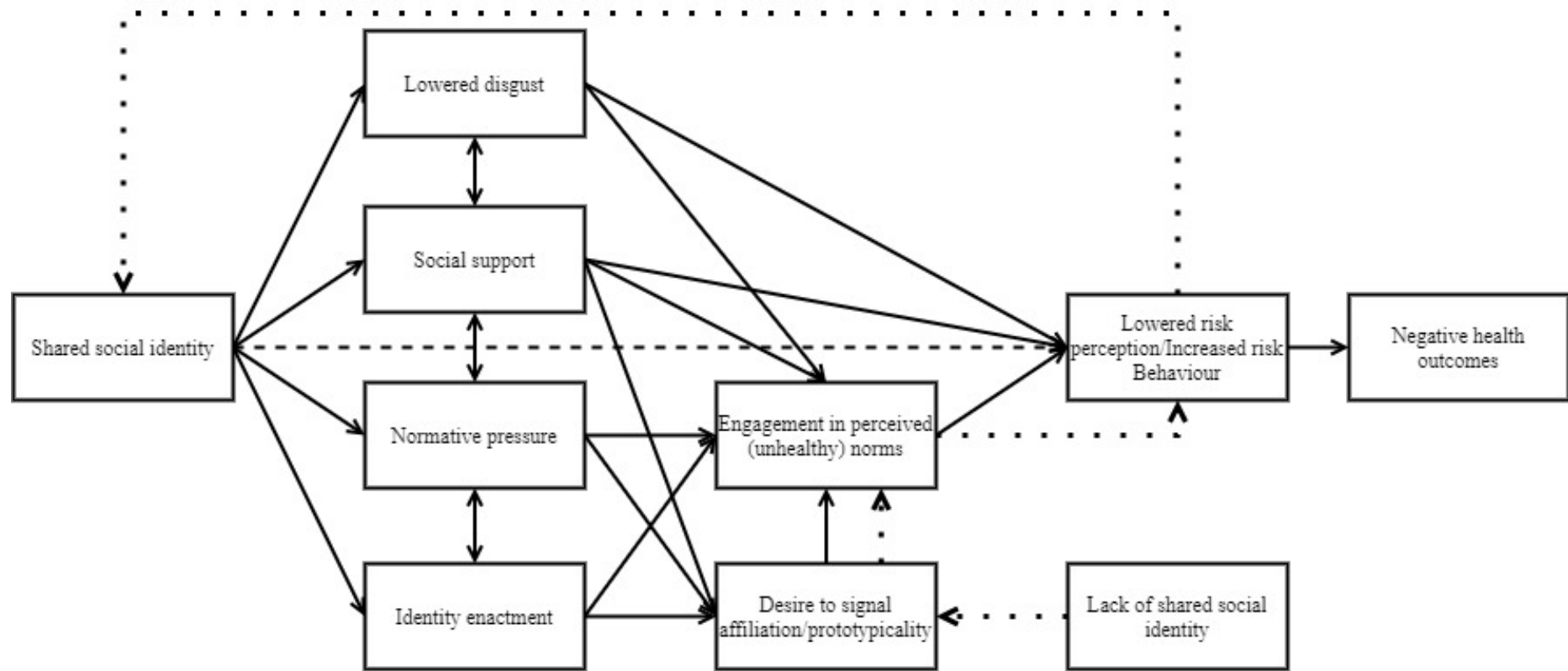
The findings expanded upon previous research (e.g., Alnabulsi & Drury, 2014; Drury, 2003; Drury et al., 2015; Hopkins et al., 2016, 2019; S. S. Khan et al., 2015; Pandey et al., 2014) by showing that the supportive nature associated with shared group membership may also undermine health risk perceptions and behaviours (see Study 1 and 5). For example, it can increase comfort with crowding (even in hazardous circumstances where there is a risk of crushing), encourage resource sharing practices (increasing the risk of disease transmission), and increase tolerance of others' risky behaviours. To expand upon this, the amiable atmosphere (i.e., positive affect,

increased trust, and mutual social support; e.g., Hopkins et al., 2016) attributable to a shared social identity in mass gatherings may lead attendees to experience a false sense of safety in risky situations (e.g., crowded places or drug consumption) because they expect others to help them if something goes astray. The amiable atmosphere may also lead people not to notice or ignore symptoms of illness rather than seek medical attention. Likewise, attendees may be more tolerant of others' risk-taking behaviours and not intervene in risky situations – *potentially* to maintain the amiable atmosphere and because it would be viewed as impeding identity enactment.

Following on from the preceding point, the findings highlight the important role norms and identity enactment may play in the negative social identity-health risk relationship (see Study 1, 4 (a systematic scoping review), and 5). They resonate with and build upon previous literature concerning the variations in norms depending on salient identities in crowd contexts and, for example, peer crowd (small group) contexts (e.g., Hopmeyer & Medovoy, 2017; Jordan et al., 2019; Reicher, 2001, 2012, 2017; Sessa, 2007; Stapleton et al., 2008); while superordinate identities may subscribe to shared norms and values, sub-identities within these events may also be associated with unique norms and values with health implications. The findings also corroborate and complement research from small group settings that has demonstrated how engagement in unhealthy norms may be motivated by a desire to express or enact an identity and through normative pressure (e.g., Cialdini & Goldstein, 2004; Guendelman et al., 2011; Johnston & White, 2003; Livingstone et al., 2011; Livingstone & McCafferty, 2015; Oyserman et al., 2007). Moreover, the findings extend research and theory concerning the social curse and crowds by highlighting a darker side of identity enactment (i.e., collective self-realisation; e.g., see (Drury et al., 2005; Hopkins et al., 2016). That is, when identity enactment is intertwined with normative shifts and related pressures

towards engagement with health risk behaviours, collective self-realisation may constitute a social curse rather than a social cure. Figure 3 presents a model of how the social curse operates in mass gatherings, based on the processes identified in this thesis to undermine health risk perceptions and behaviours.

**Figure 3**  
*A Model of How the Social Curse Operates in Mass Gatherings*



*Note.* This conceptual framework summarises key pathways through which shared social identification negatively affects health risk perceptions and behaviours in mass gatherings. The solid and dashed lines indicate direct and indirect relationships, respectively. The dotted lines depict an alternative pathway: how a lack of shared identity may lead to risk-taking to gain a shared identity.



The research has contributed to the identification of social identity processes that can be used to mitigate and manage mass gathering-associated health risks. A discussion concerning these processes and how they can be incorporated in health services and interventions is presented under the ‘Policy and Practice Implications’ section below. This is in line with the calls for research concerning the psychosocial domain of mass gathering-associated health risks (e.g., Hopkins & Reicher, 2016b, 2016a, 2017; Hutton et al., 2013, 2018, 2020; WHO, 2015; Yezli et al., 2018)

Finally, and methodologically, the research presented in this thesis has demonstrated the feasibility and value of conducting ‘non-field-based’ crowd and health risk-related research. More specifically, it has shown the flexibility and adequacy of using experimental vignettes and online surveys to collect data. This parallels relatively recent innovative research rooted in the social identity approach to crowd psychology not conducted in the field; for example, virtual reality paradigms (Drury et al., 2009; von Sivers et al., 2014), computer crowd modelling (Templeton et al., 2018), visualisation experiments of mass decontamination (Carter et al., 2015), and retrospective surveys concerning near disaster events (Drury et al., 2015). This thesis has also contributed to the development and adaptation of health risk perception and disgust measures suitable to be administered within crowd and mass gathering settings; pre-existing measures of these constructs had not been developed for use in crowd contexts.

### **Policy and Practice Implications**

The findings presented in this thesis have implications for policy and practice and may be used to develop effective health interventions. As discussed in Chapter 2, the social identity approach has provided a framework for understanding how, why, and when social identity processes will result in negative health outcomes in mass gatherings. Social identification prescribes attendees with an understanding of their values and

appropriate behaviour – understanding and drawing upon these processes is therefore paramount to develop health interventions aimed at mitigating mass gathering-associated health risks (Hopkins & Reicher, 2016a, 2016b, 2017; Reicher, 2017). By applying the social identity approach to examine mass gathering-associated health risks, the research presented in this thesis has been able to generate theoretically derived and empirically grounded tentative recommendations for the mitigation of the risks. Study 5 (a qualitative interview study) directly explored how social identity processes can be used in health interventions to this end. The recommendations outlined below are therefore based mainly on the findings from this study and complemented by the findings from the literature reviews and remaining studies of the thesis. The term ‘policymaker’ is used as a widely encompassing term here and can refer to, for example, event organisers and other ‘authorities’ involved in the planning and management of mass gathering events. Figure 4 presents a model of key social identity processes identified in this thesis to draw upon in the mitigation mass gathering-associated health risks.

### ***The Power of Norms***

That perceived norms shape health-related behaviours and that ingroup members are motivated to act in accordance with the norms of their groups has been highlighted throughout this thesis (e.g., see Study 4). Hence, engaging in health-impairing behaviours – to one’s own and fellow attendees’ health – or failure to engage in health-protective behaviours (e.g., handwashing and using available drug testing facilities) can be portrayed as non-normative/counter-normative. Expanding on this, shaping and creating (healthy) norms and invoking social disapproval by fellow attendees if these norms are violated was suggested in Study 5 to be an effective strategy for

policymakers and practitioners to employ to mitigate health risks (e.g., failure to use sunscreen or maintaining personal hygiene).

However, it is important to acknowledge that mass gathering attendance may be about breaking social norms (see Study 5); for example, it may be a form of ‘escapism’ to use substances and avoid showering, which may not be acceptable in other social contexts (Hitchings et al., 2018; Hutton et al., 2013, 2018, 2020). Policymakers and practitioners therefore need to be aware that, for example, rowdy behaviour at football matches and compromised hygiene at music festivals may not be experienced or perceived by attendees as stressors or health risks but instead as important aspects of identity enactment. Attempts to mitigate such behaviours should focus on acknowledging the positive affect associated with engagement in the behaviours (e.g., a sense of freedom) that are seen as normative and integral to identity enactment (Hopkins et al., 2016) while simultaneously reminding attendees of the health-impairing effects.

### ***Capitalising on Social Support***

Study 1-3 and 5 demonstrated the relational intimacy and supportive nature of psychological crowds and highlighted how this may undermine health risk perceptions and behaviours. As has been suggested in Chapter 5 and 7 (Study 2, 3, and 5), policymakers and practitioners should capitalise on this mutual social support and promote the protection of other attendees’ health and wellbeing (e.g., helping those who fall in the ‘mosh pit’ or who have consumed an excessive amount of alcohol). To this end, attendees can be encouraged to consider the degree to which their behaviour may not only affect their own health but also that of their fellow crowd members with whom they identify and value (e.g., smoking around others, not using a condom, sharing resources that carry the risk of infection or (even inadvertently) pressuring others to engage in risky behaviours). Relatedly, attendees should be reminded that while

collective participation is associated with positive affect, they should not ignore symptoms of illness – their own and the collective’s – and instead seek medical attention. They can then prolong their participation and positive affect rather than having to cut it short when the symptoms eventually become too severe.

### ***Ensuring Sensitivity to Superordinate and Sub-identities***

To reiterate an argument put forward in Chapter 7 (Study 5), to manage mass gathering-associated health risks and ensuring the health and safety of attendees, it is essential to develop services and interventions that are perceived as legitimate within any given mass gathering (see ‘The Source of the Message’ below for further discussion surrounding legitimacy). Legitimacy is, in turn, established via an understanding of how mass gatherings involve the enactment of social identities and how the content of identity enactment depends on the enacted superordinate and sub-identities; Study 4 and 5 highlighted how sub-identities are associated with unique values and norms with differing health implications. It is therefore important that policymakers and practitioners give this variability, or arguably specificity, close attention – each type of event will involve the enactment of a particular assemblage of identities and engagement with corresponding health risks. Hence, health services and interventions that demonstrate sensitivity to the values and norms associated with the enactment of both superordinate and sub-identities are more likely to be effective.

### ***The Source of the Message***

Turning to the mode of delivery of health interventions (including services and messages), it is clear that a balance has to be struck between facilitating participation in mass gatherings while protecting participants’ health. To do this, policymakers and practitioners should consider the insights provided by social psychological research and theory concerning collective participation; they should harness such insights to gain a

better understanding of how to intervene to mitigate health risks without undermining collective participation and the social identity processes involved (e.g., enactment of valued social identities).

The findings from this thesis indicate that, for health services and interventions to be effective, it is essential that they are perceived as legitimate by the mass gathering attendees and facilitating rather than preventing identity enactment. This may motivate attendees to comply with recommended actions (e.g., drug testing or handwashing) and is in line with previous research regarding compliance in policing and mass emergency contexts (e.g., Carter et al., 2015, 2018; Reicher et al., 2004; Stott, Hoggett, et al., 2012, 2020; Stott & Drury, 2017, 2017). To expand on this, the ‘Elaborated Social Identity Model’ (ESIM; e.g., Drury & Reicher, 2000; Reicher, 1984; Reicher et al., 2004; Stott et al., 2001; Stott & Drury, 2000) was introduced in Chapter 2 and suggests that where crowd members perceive the actions of another group (e.g., security personnel or healthcare professionals) as legitimate, this can promote a shared identity between crowd members and the other group. This, in turn, may lead crowd members to perceive recommended actions promoted by the other group as normative of the ingroup and thereby increase compliance whereas the opposite is true if recommended actions are perceived as illegitimate. Communicating shared values and norms is therefore key.

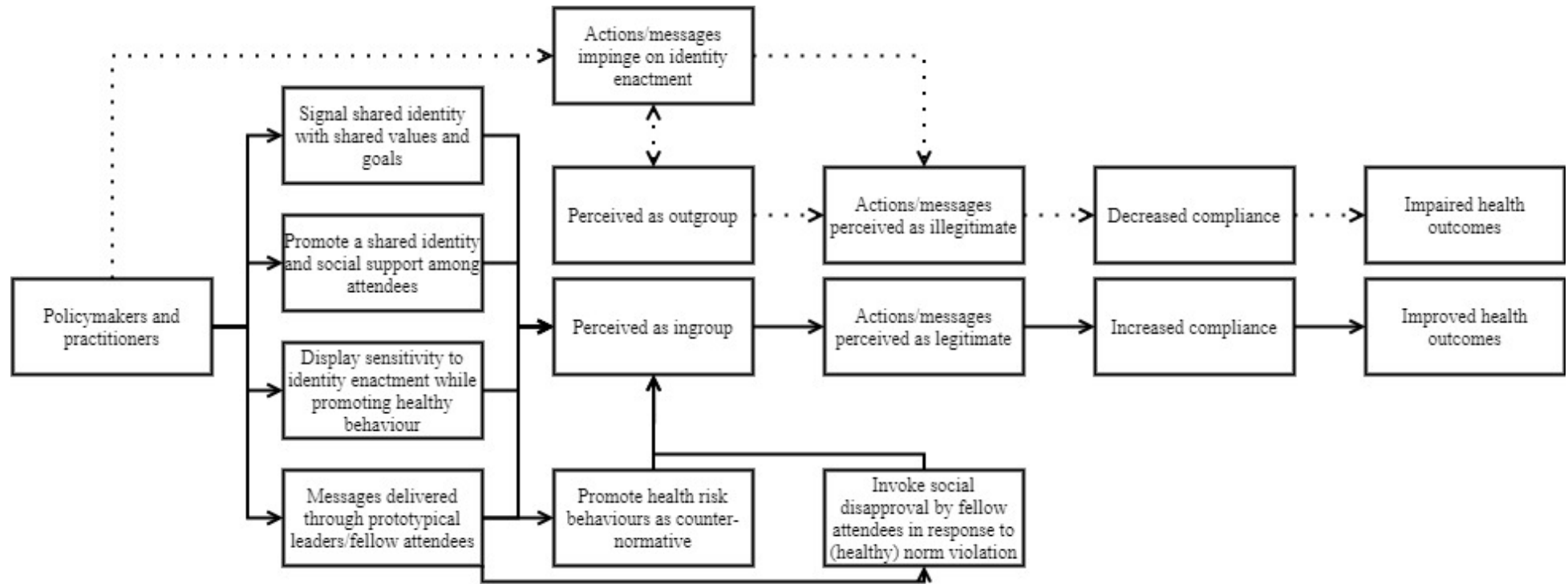
Attendees may, for example, feel safer seeking medical attention if relevant services signal a shared social identity and a common goal of reducing health risks (e.g., ‘We are all in it together to reduce the spread of pathogens/drug-related incidences through the use of sterile ritualistic paraphernalia/drug testing’) while highlighting that the services (and personnel) are in place to facilitate safer engagement in identity enactment. Such messages and practices promote a shared identity, invoking a sense of trust and support

while communicating health-promoting norms without impinging on (health-wise undesirable) values and norms that may be integral to identity enactment.

Communicating a shared identity may be particularly relevant at music festivals as stigmatisation of sexual promiscuity and substance use may lead people to refrain from seeking medical attention or be uncooperative (see Study 5).

Furthermore, Study 2, 3, and 5 emphasised the importance of the source of health-related messages to increase trust and credibility and, in turn, compliance with the recommended actions. Policymakers should deliver health messages through prototypical ingroup members, such as leaders (e.g., bands, sports teams, and religious leaders) and fellow crowd members (e.g., frequenters of specific events). These recommendations are rooted in social identity literature concerning, for example, trust, prototypicality, norms, leadership, credibility, conformity, and mutual influence discussed in preceding chapters (e.g., see Abrams et al., 1990; Abrams & Hogg, 1990; Blair et al., 2017; Cialdini & Goldstein, 2004; Fransen et al., 2015; S. A. Haslam et al., 2011; S. A. Haslam & Platow, 2001; Hogg, 2001; Louis et al., 2007; Platow et al., 2012; Reicher et al., 2005; Ross et al., 2014; Tanis & Postmes, 2005; Turner, 1991, 2005).

**Figure 4**  
*A Model of How Policymakers and Practitioners Can Use Social Identity Processes*



*Note.* Solid lines indicate a pathway using social identity processes whereas dotted lines indicate a pathway depicting the potential implications of not considering social identity processes.

## Strengths and Limitations

### Strengths

Although the justifications for the use of the mixed methods approach in this thesis have been outlined in detail in Chapter 3, it seems pertinent to reiterate and reflect on the (overall) strengths of the approach *after* its employment. The approach has enabled the use of various methods of data collection and analyses to comprehensively examine the aggravation and mitigation of mass gathering-associated health risks, from a social identity perspective. It has been able to address different research questions broadly and in-depth. This approach was selected because of the very limited knowledge of the implications of social identity processes for health outcomes in these complex settings, requiring both inductive and deductive techniques, or in other words, both exploration and explanation. Hence, the use of both quantitative and qualitative research methods provided a more nuanced understanding of the research problem and enabled reflectivity and flexibility (both practically and epistemologically) in the conduct of the research.

Although the studies comprising this thesis represent distinct empirical contributions, outcomes of preceding studies informed the design of proceeding studies. For example, healthcare professionals (Study 5) were asked about social identity processes identified as underpinning the social identity-health risk relationship in previous studies (Study 1 and 4). Likewise, the systematic review (Study 1) and quantitative studies (Study 2 and 3) paved the way for a more exploratory research phase (i.e., systematic scoping review and qualitative interview study) by empirically establishing the scope of the literature and the negative social identity-health risk relationship in mass gatherings; subsequent research could then explore additional underpinning processes in this relationships and potential means to mitigate the risks. Together, the studies complement one another and



enabled triangulation of data, combining and contrasting different research methods and findings, from different perspectives, to advance understanding of the negative social identity-health relationship and its mitigation – this reflects a strength of the research (Archibald, 2016; R. Campbell et al., 2020; N. Carter et al., 2014; Creswell & Plano Clark, 2017; Heale & Forbes, 2013; R. B. Johnson et al., 2007; R. B. Johnson & Onwuegbuzie, 2004; Morgan, 2007; Tashakkori & Creswell, 2007; Tashakkori & Teddlie, 2010).

### **Limitations**

Besides the positive aspects of the research, as inherent to all research projects, there are limitations to this research that need to be addressed. Several of the limitations of the individual studies have been outlined in the respective chapters and will not be the focus here. The following sections will instead discuss additional limitations with a primary focus on the limitations of the thesis as a whole.

#### ***Non-field-based, Retrospective, and Subjective Data***

The most apparent limitation of the programme of research is that no field-based study was conducted, and one may therefore question the ecological validity of the research. Moreover, as has also been argued in previous chapters, the findings from Study 3 and 5, which focused upon UK-based music festivals and a Catholic pilgrimage, may not necessarily generalise to other types of mass gatherings. This is particularly possible given the different social identities within and between events with unique health-related beliefs, values, and norms (Hopkins & Reicher, 2017). However, it should be noted that the thesis sought to provide initial, ‘proof-of-concept’ evidence and to further theorisations about the topic area, for which the selected methods were deemed appropriate (see Chapter 5 for additional discussion about why no field-based study was conducted). Data collection has also been limited to a retrospective experiment and

survey, systematic reviews of the literature, and qualitative interviews with healthcare professionals – data collection from the experiment, survey, and interviews, in particular, relied upon subjective reports. No data concerning actual (objective) participant behaviour has been collected. Had data been collected in the field (i.e., within an ongoing mass gathering), the data would likely have been less subject to recall biases (e.g., see ‘fading affect bias’ and ‘rosy view’; Mitchell et al., 1997; Ritchie et al., 2015; Skowronski et al., 2014) or issues associated with attitudes and intentions not always translating to behaviour (Glasman & Albarracín, 2006; Sheeran, 2002). Likewise, attendees themselves have not been interviewed about their experiences of mass gathering participation and health risks, such as motives and meanings underpinning engagement in health risk behaviours in mass gatherings. Had attendees provided their perspectives of the research problem, a richer and potentially different understanding may have been obtained (Creswell & Plano Clark, 2017; Green & Thorogood, 2018).

### *Quantitative Measures*

The measures employed in the quantitative studies (Study 2 and 3) exclusively targeted social identity processes. This can be considered theoretically dogmatic, leading to over-estimations of the importance or weight of these processes in undermining health risk perceptions and behaviours. Given the small effect sizes obtained in these studies, this is not an unfeasible conclusion to draw and indicates that other processes may be important to consider (e.g., personality characteristics). A wealth of literature views risk-taking through a lens of individual risk factors, such as impulsivity, sensation seeking, and extraversion, and has consistently linked these factors to increased risk-taking (e.g., see Breivik, et al., 2020; Dawe & Loxton, 2004; Lauriola et al., 2014). It may be important to test how social identity processes interact with these factors and

the extent to which social identity processes can explain lowered health risk perceptions and increased health risk behaviours in mass gatherings above and beyond these factors.

### ***Researcher Bias***

Although being able to probe interviewees (Study 5) about processes identified to be important in the social identity-health risk relationship through previous research can be seen as a strength, it is not without its caveat. Some aspects of the interviews may have been viewed as more important to the study, because of the researcher's pre-existing knowledge and research interests, and therefore received more attention in the interviews, potentially neglecting other aspects of the interviews. However, it has been suggested that the researcher's knowledge within the topic area can be a strength rather than a limitation because it increases the researcher's understanding of the relevant concepts (e.g., see Ronald, 2011). Had the researcher been unfamiliar with social identity theory and its principles, discerning important processes and aspects of the interviews would have been problematic, potentially leading to neglect of important processes and aspects of the interviews. Furthermore, the supervisors of the research reviewed the analysis of the data, ensuring investigator triangulation (i.e., providing multiple observations and conclusions; Archibald, 2016; N. Carter et al., 2014; Heale & Forbes, 2013). In a similar vein, concerning Study 2, the primary supervisor reviewed the classification of data derived from a manipulation check in the experiment, followed up with an inter-rater reliability test.

With regard to the systematic reviews, as inherent to qualitative approaches, narrative synthesis is subject to author interpretations (Creswell & Plano Clark, 2017; R. B. Johnson & Onwuegbuzie, 2004) – a common criticism of the technique (M. Campbell et al., 2018). A meta-analysis of a homogenous collection of studies would, if possible, provide a more objective, quantitative estimate of the studied phenomenon

(Mikolajewicz & Komarova, 2019). Nonetheless, the primary supervisor of the research reviewed steps of the process to decrease the risk of researcher bias (Higgins et al., 2019).

### ***Inclusivity/Exclusivity of Systematic Reviews***

Further regarding the systematic reviews, a limitation associated with both of the reviews concerns their inclusivity, or arguably, exclusivity. As discussed in Chapter 6, search terms relating to health risk perceptions and behaviours were non-specific (i.e., focusing on health risk perceptions and behaviours in general rather than, for example, smoking or intravenous drug use). This, however, was a deliberate choice to gain a broad overview of the research topic, given the scarce literature concerning the negative social identity-health relationship in mass gatherings; some affected health risk perceptions and behaviours may have been missed if the search terms were based on presumptions about what perceptions and behaviours are affected (and researched). By the same token, the search terms may have excluded studies that did not explicitly seek to address ‘social identity’ but were still relevant to the research questions. Moreover, because the search only retrieved articles based on keywords in their titles and abstracts, some relevant articles were likely not captured because they did not include such keywords (or MeSH terms).

### ***Interview Sampling Strategy***

There are issues surrounding the sampling strategy in Study 5 that should be acknowledged. The sample was self-selected. Potential participants were sent information about the studies, including a brief conceptual explanation of social identification, and based on this information decided whether they wished to participate. It is possible that the HCPs who chose to participate may have recognised or understood the concept, at least to an extent, and therefore felt comfortable enough to

be interviewed. By contrast, HCPs unfamiliar with the concept may have shied away from the research – it is possible that their accounts would have been starkly different from the HCPs that participated in the research.

### **Future Research Directions**

Although this second to last section marks the end of the thesis, it should be viewed as the beginning of a new venture in the development of the social identity approach to crowds and health. The thesis has addressed and answered several important questions in the field but has likewise given rise to many more that have not been within the scope of the thesis to delve into. This paves the way for several avenues for future research, and there are two avenues that are particularly obvious and tangible. First, it is clear that the social identity-health risk relationship in mass gatherings needs to be further investigated to corroborate the findings of the thesis and pinpoint additional underlying processes. Second, there is a need to test the efficacy of incorporating social identity processes into health interventions and services aimed at mitigating and managing mass gathering-associated health risks. Justifications and recommendations for future research are provided below.

#### **Examining Underlying Processes**

Future research should focus on corroborating the thesis findings and unearthing additional processes underpinning the social identity-health risk relationship in mass gatherings. At the final (write-up) stages of this thesis, two journal articles were published which demonstrated that the social identity-health risk relationship in mass gatherings is also underpinned by increased trust (Cruwys, Greenaway, et al., 2020) and that engaging in risk behaviours can signal trust and facilitate social identification (in a non-mass gathering setting; Cruwys, Stevens, Platow, et al., 2020). Returning to Study 1 in this thesis, the findings from the review suggested that attendees who feel socially

isolated may endorse and engage in risk behaviours perceived to be normative to gain social approval. Furthermore, the findings from Study 5 indicated that mass gathering attendees may engage in risk behaviours for reasons of social approval. Considering these studies together, it is not unfeasible to assume that attendees can engage in risk behaviours perceived to be normative to communicate that they share an identity with and belong in the crowd (or sub-identities within the crowd). However, none of the above studies have tested this empirically. It remains for future research to explore whether people are motivated to engage in risk behaviours in mass gatherings to signal and gain or enhance a sense of shared identity. Further regarding Cruwys et al.'s (2019) study reviewed in Study 1, which served to profile mass gathering attendees at risk of experiencing a mental health crisis (e.g., male, socially isolated, part of a collective within which risk-taking is normative, and a personality predisposition towards impulsivity), similar research could be carried out in the future to profile attendees that are, for example, more likely to engage in health risk behaviours (e.g., based on variables such as social networks within the event, motivations for attending, and personality traits).

The articles by Cruwys and colleagues corroborate the findings from this thesis and highlight similar priorities for further research. For example, the thesis findings (Study 1 and 5) indicate that social support may be implicated in the social identity-health risk relationship in mass gatherings; this seems particularly possible given the now existing evidence for how trust (which is arguably closely related to social support) in ingroup members may undermine health risk perceptions and behaviours in mass gatherings. The thesis findings (Study 1, 4, and 5) also indicate how unhealthy group norms, normative pressure, and identity affirmation and enactment are important processes to

consider in the aggravation (and mitigation) of mass gathering-associated health risks. Examining these outlined processes is a potential avenue for future research.

### **Further Systematic Reviews and Meta-analyses**

The empirical evidence base concerning the negative social identity-health risk relationship in mass gatherings is evidently growing at a steady pace. It may be relevant, in the near future, to conduct a systematic review of this literature to map and critically evaluate the size and rigour of the evidence base; in line with the argument that a meta-analysis could have provided a more objective view in the systematic reviews of this thesis, future research may wish to consider this. Providing a comprehensive and critical overview of the research should serve to make the research more accessible to a wider audience, including to the field of mass gathering medicine, and stimulate future interdisciplinary and multidisciplinary research.

### **Expert Opinion and Health Interventions**

In the quest to pinpoint additional mechanisms that may be implicated in the social identity-health risk relationship (in terms of both the aggravation and mitigation of health risks) in mass gatherings, and to identify future research directions and priorities, a Delphi study was planned as the last study of this thesis. However, because of the COVID-19 pandemic, the study was prevented from being carried out as it would involve a time-consuming process for the intended participants (e.g., social psychologists, public health experts, and healthcare professionals). This is a sample that was likely already overwhelmed by the circumstances and would not be able to complete (or even begin) the Delphi process. To clarify, the Delphi method involves an iterative process to synthesise expert opinion and, if possible, reach consensus on a topic while also highlighting differences in opinion. The method is particularly useful when examining a complex topic where evidence is sparse and expert opinion is

important to inform theory, research, policy, and/or practice – as is the case regarding the mitigation of mass gathering-associated health risks using social identity processes (Hasson et al., 2000; Hsu & Sandford, 2007; Thangaratinam & Redman, 2005; Wilkes, 2015).

The method was thought to be useful because it would elicit interdisciplinary and multidisciplinary input from a range of ‘experts’, providing new insights not necessarily provided in previous theoretical accounts (e.g., Hopkins and Reicher, 2016b, 2016a, 2017). Relatedly, the main premise of the Delphi method is that group opinion, as opposed to individual opinion, is more valid and reliable; conducting the study would have contributed towards gaining consensus on social identity processes that are important to consider in the aggravation and mitigation of mass gathering-associated health risks (Keeney et al., 2011). Furthermore, if the insights from social psychology is to be absorbed by the field of mass gathering medicine, collaborative research designs such as the Delphi method is arguably an important initial stepping-stone.

Future research should continue pursuing the Delphi study that was planned for this thesis. Although the exact research approach may not necessarily be adopted, it is arguably essential to consult experts in the field, including both practitioners and social psychologists, as a preliminary step – particularly if the goal is to incorporate a social-psychological dimension into mass gathering medicine and facilitate multidisciplinary collaborations and research translations.

Future research should also seek to gain an understanding of legitimacy and what it entails for the provision of healthcare in mass gatherings. That is, it is essential to examine perceived legitimacy of healthcare professionals and other authorities in any given mass gathering context and its implications for attendees’ compliance and use of



health services. Applying ESIM (e.g., Drury & Reicher, 2000; Reicher, 1984; Stott & Drury, 2000) may be particularly relevant in this regard. As was discussed in Study 5, identity enactment has implications for how groups define themselves in relation to other groups (e.g., supporters of rival football teams or attendees versus healthcare professionals). Healthcare interventions should therefore be devised in a way that facilitates rather than undermines identity enactment. The logistics and means of how this can be achieved is for future research to further investigate, which should also focus on *how* legitimacy is attained among healthcare professionals (and other authorities) in diverse mass gathering contexts. For example, future research designs may involve examination of the discourse used in health messages (e.g., advertisement on event websites and posters within events) and employment of ethnographic observations of direct interactions between attendees and healthcare professionals or other authorities. Once additional research has provided a comprehensive understanding of social identity processes and their use in health interventions, and perceived legitimacy of healthcare professionals (and other authorities), another avenue for future research is evident – testing the efficacy of incorporating social identity processes identified in this thesis, the suggested Delphi study, and any other additional research into health interventions and services in mass gatherings.

### **Methodological Improvements**

Following up on the ‘Strengths and Limitations’ section, several methodological recommendations for future research can be made. First, as argued in Chapter 5, future research should collect data in the field and not rely on retrospective data to reduce the risk of memory distortion and to increase ecological validity. Ethnographic research, including interviews, surveys, and observations of attendees’ health risk-related practices, may be particularly relevant to this end, and follows the tradition of previous

research on crowd psychology (e.g., Drury & Reicher, 2005; Stott & Drury, 2000). Similarly, it may be of interest to employ longitudinal research designs to examine changes in health risk perceptions and behaviours over time as a function of, for example, increasing social identification and changes in norms. Second, objective rather than subjective measures of health risk perceptions and behaviours should also be employed, be it in an artificial setting or in the field (e.g., frequency of sharing resources (and what resources are shared), handwashing, and time spent in densely crowded areas or next to another crowd member who is visibly infectious). Third, additional types of mass gatherings should be examined and compared and contrasted considering health-related values and norms vary from event to event. Finally, future qualitative research should seek to interview mass gathering attendees about their own experiences concerning social identity processes and engagement in health risks.

### **COVID-19 and Future Pandemics**

Future research could follow up on the recommendations provided in the thesis concerning the aggravation and mitigation of mass gathering-associated health risks and examine their explanatory scope for collective behaviour during pandemics, and the management of collective behaviour to reduce the spread of the virus. The programme of research presented in this thesis is relevant to the COVID-19 pandemic. Given the focus on banning large gatherings, social (physical) distancing, and gradual re-opening of society to prevent hospitals from being overwhelmed, the empirical findings are relevant to health policies aimed at managing collective behaviour during the ongoing and future pandemics. A reviewer recommended that the manuscript reporting Study 5 should be partially rewritten to focus on its relevance to COVID-19 and health policies to foreground the timeliness of the manuscript. Moreover, the published manuscript reporting Study 2 and 3 has received multiple citations because of its relevance to

collective behaviour during COVID-19 (i.e., how shared group membership can attenuate health risk perceptions and increase health risk behaviours; see Cruwys, Stevens, & Greenaway, 2020).

### **Concluding Statement**

This thesis has focused on the psychosocial domain of the aggravation and mitigation of mass gathering-associated health risks. More specifically, regardless of the limitations addressed in this discussion, this thesis has contributed towards advancing the understanding of mass gathering-associated health risks from a social psychological perspective – the social identity approach. It has therefore begun to address the neglect of the implications of psychosocial factors for mass gathering-associated health risks. Empirical evidence of the negative social identity-health risk relationship in mass gatherings has been provided, highlighting how social identification is not a panacea (or a ‘social cure’); it can also be noxious (or a ‘social curse’), including in mass gathering settings. Theoretical and empirical ground has been offered concerning how health risk perceptions and behaviours can be undermined through a range of social identity (and related) processes and mechanisms, including disgust, norms, and identity enactment. The thesis has provided a battery of recommendations for future research and practice – for both corroboration and elaboration of the negative social identity-health risk relationship in mass gatherings and how to mitigate risks by drawing upon social identity processes. This is a task which arguably necessitates interdisciplinary and multidisciplinary collaboration to gain a comprehensive perspective of the research problem to appropriately address a complex social context with serious associated health risks – without compromising the pleasure and ecstasy of collective participation.

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## Appendices

### Appendix A: Information Sheet (Study 2)



## INFORMATION SHEET

**Study Title:** Social identity, crowds and health: A vignette study

### Invitation

You are being invited to consider taking part in the research study Social identity, crowds and health: A vignette study. This project is being undertaken by Daniella Hult Khazaie, a PhD candidate of Keele University (United Kingdom), and supervised by Dr Sammyh Khan and Professor Clifford Stott.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully. Ask us if there is anything that is unclear or if you would like more information.

### Aims of the Research

This study aims to investigate individuals' experiences and perceptions of crowd by asking them to imagine a crowd and report what they may experience in the imagined crowd.

### Why have I been invited?

You have been invited as you fulfil the study criteria - you are 18 years of age or older and from the United Kingdom or United States. Approximately 200 other participants are anticipated to complete the study.

### Do I have to take part?

You are free to decide whether you wish to take part or not. If you do decide to take part you will be asked to provide your informed consent. You are free to withdraw from this study at any time and without giving a reason. However, once you have completed the survey, you will no longer be able to withdraw your data unless you are able to provide the IP address of the device you completed the

survey on. Withdrawal of data can be done within one month of submitting your data. As such, you will be able to withdraw your data on or before  $\{date://OtherDate/FL/+1\%20month\}$ .

### **What will happen if I take part?**

After reading this information sheet you will be asked to provide your informed consent to take part in this study, if you are still happy to participate. The next step will be to read brief information about crowds and social identity. You will then be asked to recall a crowd you have been part of and subsequently complete the survey which contains a series of questions about your experiences, perceptions and feelings in the recalled crowd. This study takes approximately 25 minutes to complete.

### **What are the benefits (if any) of taking part?**

There may not be any direct benefits to you of taking part. However, findings may further our understanding of the role of psychosocial factors in crowds.

### **What are the risks (if any) of taking part?**

There are no foreseeable risks of taking part in this study.

### **How will information about me be used?**

Participation is anonymous - your responses will be pooled with other participants' data and used for analysis. In accordance with American Psychological Association guidelines, the overall results may be submitted for publication in a scientific journal or presented at scientific conferences. Additionally, it is likely that the overall results will be included in a PhD thesis. The collected data may be retained for 5 years and used in future research studies for which ethical approval will be sought.

### **Who will have access to information about me?**

All data that will be collected will be anonymous, pooled and presented in aggregate form only – therefore no participants will be identifiable. Only the principal investigator and supervisors of the research will have access to the study data. The data will be retained by the principal investigator for 5 years after completion of the study on a password-protected computer, it will subsequently be securely disposed of. The supervisors of the project will securely store the data on password-protected computers indefinitely.

**Who is funding and organising the research?**

This research project is funded by Keele University and is being organised by Daniella Hult Khazaie who has received a PhD scholarship from the university.

**What if there is a problem?**

If you have a concern about any aspect of this study, you may wish to speak to the researcher who will do their best to answer your questions. You should contact Daniella Hult Khazaie via [a.k.d.hult.khazaie@keele.ac.uk](mailto:a.k.d.hult.khazaie@keele.ac.uk) or (+44)1782 34247.

Alternatively, if you do not wish to contact the researcher you may contact Dr Sammyh Khan via [s.s.khan@keele.ac.uk](mailto:s.s.khan@keele.ac.uk) or (+44)1782 733625.

If you remain unhappy about the research and/or wish to raise a complaint about any aspect of the way that you have been approached or treated during the course of the study, please write to the Research Integrity Team which is the University's contact for complaints regarding research at the following address:

Research Integrity Team

Directorate of Research, Innovation and Engagement

IC2 Building, Keele University, ST5 5NE

Email: [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk)

Tel: 01782 733371

**Contact for further information**

Daniella Hult Khazaie

[a.k.d.hult.khazaie@keele.ac.uk](mailto:a.k.d.hult.khazaie@keele.ac.uk)

(+44)1782 34247

Version no. 1.1, February 2018

## Appendix B: Consent Form (Study 2)

### CONSENT FORM

If you wish to take part in this study, please click on the statements below if you agree with them:

- I confirm that I have read and understood the information sheet dated February 2018 (version no. 1.1) for the above study.
- I understand that my participation is voluntary and that I am free to withdraw at any time. However, once I have completed the survey, I will no longer be able to withdraw my data unless I can provide the IP address of the device I completed the survey on within one month of submission (i.e. a withdrawal request must be submitted on or before  $\${date://OtherDate/FL/+1\%20month}$ ).
- I agree to take part in this study.
- I allow my anonymised data to be used for publications, conferences and future research projects.

## **Appendix C: Participant Instructions (Study 2)**

### **PLEASE READ THE FOLLOWING INFORMATION CAREFULLY:**

Although we sometimes define ourselves based on our personal identities (what distinguishes us from others) we can also define ourselves based on our social group membership - i.e. our social identity. For example, we may define ourselves in terms of our nationality (e.g., as British or American) and/or in terms of the football club we support (e.g. a Liverpool or Manchester United fan). People in a physical crowd (where people are co-present by chance) retain a strong sense of personal identity despite being together with so many others. Examples of such crowds include shoppers in a busy shopping mall or travellers in a busy airport. In contrast, people in a psychological crowd think of themselves and others in the crowd as members of a common group and assume a shared social identity. In a psychological crowd (e.g. a religious festival, a musical festival or a sports event) one may think of oneself as a part of a collective with a shared identity (e.g. as pilgrims, festival-goers or sports enthusiasts).

Please recall a time you were in a very large crowd of people where you felt that you [did not share a social identity / shared a social identity] with other crowd members [(a physical crowd / psychological crowd)]. With such a scenario in mind, please complete this survey.

## Appendix D: Ethical Approval Letter (Study 2)



02/03/2018

Dear Daniella

**PI: Daniella Hult Khazaie**

**Title: The effect of shared social identity on health risk perceptions in mass gatherings**

**Ref: ERP3138**

Thank you for submitting your application for review. The proposal was reviewed by the Panel Chair. I am pleased to inform you that your application has been approved by the Ethics Review Panel.

If the fieldwork goes beyond the date stated in your application, or there are any amendments to your study you must submit an 'application to amend study' form to the ERP administrator at [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk). This form is available via <http://www.keele.ac.uk/researchsupport/researchethics/>

If you have any queries please do not hesitate to contact me, in writing, via the ERP administrator, at [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk) stating **ERP3138** in the subject line of the e-mail.

Yours sincerely

PP.

A handwritten signature in black ink, appearing to read "V. Ball", written over a horizontal line.

**Dr Valerie Ball**

**Chair – Ethical Review Panel**

## Appendix E: List of Items and Factor Matrices (Study 2)

### Items and loadings for shared social identity (SSI)

Item	Loading
I felt at one with the people around me in the crowd (SSI3)	.96
I felt unity with other people in the crowd (SSI2)	.95
I identified with other people in the crowd (SSI1)	.95
I was similar to other people in the crowd (SSI4)	.91

### Items and loadings for Perceived Disgust (PD)

Item	Loading
Standing close to another crowd member who is coughing and sneezing (PD7)	.77
Accidentally touching a crowd member's bloody cut (PD4)	.73
You take a sip of soda, and then realise that you drank from the glass that another crowd member had been drinking from (PD5)	.72
Standing close to a crowd member who has body odor (PD2)	.70
Shaking hands with a crowd member who has sweaty palms (PD3)	.67
Sitting next to a crowd member who has red sores on their arm (PD1)	.67
You use a public toilet in the crowd and then realise the soap has run out (PD6)	.65

### Items and loadings for Perceived Vulnerability to Disease (PVD)

Item	Loading	
	Comp. 1	Comp. 2
It would not have made me anxious to be around sick people in the crowd (PVD7)	<b>.73</b>	.07
I would have been comfortable sharing a water bottle with another crowd member (PVD6)	<b>.70</b>	.27
My immune system would have protected me from most illnesses in the crowd (PVD2)	<b>.70</b>	-.26
I would have been unlikely to catch a cold, flu or other illness in the crowd (PVD1)	<b>.69</b>	-.25
I would have avoided using public toilets because of the risk that I may have caught something from other crowd members (PVD5)	-.14	<b>.80</b>
I would have preferred to wash my hands pretty soon after shaking a crowd member's hand (PVD4)	.10	<b>-.78</b>
I was more likely to catch an infectious disease in the crowd (PVD3)	.07	<b>-.72</b>

*Note:* Major loadings for each item are bolded.



Items and loadings for Likelihood of Engaging in Health Risk Behaviours (HRBLI)

Item	Loading
If it suddenly started raining heavily and you got completely soaked, how likely is it that you would have accepted another crowd member's towel to dry yourself with? (HRBLI4)	.82
If the weather turned for the worse and you discovered that you had not brought any warm clothes, how likely is it that you would have accepted another crowd member's item of clothing to keep yourself warm? (HRBLI1)	.81
If you were extremely thirsty and a crowd member offered you a bottle of water they had been drinking from, how likely is it that you would have drank from the bottle? (HRBLI2)	.78
If another crowd member displayed flu-like symptoms and suddenly felt too fatigued to stand up on their own, how likely is it that you would have physically supported them? (HRBLI3)	.58

Items and loadings for Perceived Riskiness of Engaging in Health Risk Behaviours (HRBRI)

Item	Loading
(HRBRI2) How risky would it be for you to do this in relation to your health?	.79
(HRBRI4) How risky would it be for you to do this in relation to your health?	.74
(HRBRI1) How risky would it be for you to do this in relation to your health?	.73
(HRBRI3) How risky would it be for you to do this in relation to your health?	.70

Loadings for all scales

Item	Components					
	1	2	3	4	5	6
PD2	<b>.81</b>	.01	.04	-.06	.15	-.01
PD4	<b>.74</b>	-.04	.01	.09	.04	.05
PD7	<b>.73</b>	-.03	-.01	-.13	-.16	-.09
PD6	<b>.54</b>	.06	-.11	.04	-.21	-.09
PD1	<b>.52</b>	-.24	.00	-.00	-.03	-.34
PD5	<b>.51</b>	.10	.11	.38	-.25	.107
PD3	<b>.48</b>	-.06	-.18	.11	-.18	-.19
SSI2	-.03	<b>.94</b>	-.01	.02	-.01	-.04
SSI3	-.01	<b>.94</b>	-.05	-.03	-.07	-.00
SSI4	-.03	<b>.94</b>	.01	-.05	.01	-.03
SSI1	.04	<b>.90</b>	-.03	-.02	.06	-.07
PVD2	-.12	-.12	<b>.68</b>	-.11	-.10	-.31
PVD1	-.14	-.08	<b>.67</b>	-.04	-.02	-.37
PVD7	.02	-.03	<b>.66</b>	.06	-.07	.05
PVD6	.21	-.07	<b>.64</b>	.14	.08	.31
PVD3	.04	.09	.13	.03	.01	<b>-.78</b>
PVD5	.25	.05	-.10	.07	-.12	<b>-.58</b>
PVD4	.33	.08	.19	.10	-.02	<b>-.56</b>
HRBLI4	.04	.08	.14	<b>-.81</b>	.09	.10
HRBLI2	-.15	-.07	-.28	<b>-.73</b>	-.03	-.20
HRBLI1	-.11	.14	.01	<b>-.72</b>	-.04	-.14
HRBLI3	.17	.02	.01	<b>-.64</b>	-.01	.26
HRBRI4	-.09	.00	-.25	.08	<b>-.78</b>	-.05
HRBRI2	.05	.07	.25	.11	<b>-.75</b>	.12
HRBRI3	.01	-.02	.21	-.18	<b>-.72</b>	.04
HRBRI1	.10	-.05	-.09	.02	<b>-.64</b>	-.08

*Note:* Major loadings for each item are bolded.

## Appendix F: Outline of the Inter-rater Reliability Process (Study 2)

Responses (N = 269) to the qualitative manipulation check asking participants to write down the crowd that they were thinking about when responding to the items in the study were collated in an Excel document (one statement per row). Each author obtained a copy of this document and independently assessed if they believed that the participants should be included versus excluded based on whether or not the crowd event that they had recalled was consistent with the condition to which they had allocated; inclusion was assigned a code of 1, whereas exclusion was assigned a code of 2. The authors had agreed beforehand to exclude participants that had provided a bogus (e.g., a random string of letters) or no response as it would be impossible ascertain the type of crowd event that they had recalled, or if they had recalled a crowd event at all. The authors' independent judgements were imported into SPSS wherein the inter-rater reliability analysis was conducted. The crosstabulation output is presented below:

### SK \* DHK Crosstabulation

Count

		DHK		Total
		1	2	
SK	1	203	10	213
	2	3	53	56
Total		206	63	269

The crosstabulation table above shows that the authors agreed upon the inclusion of 203 and exclusion of 53 of the 269 participants. This left 13 participants (i.e., 3 + 10 = 13) that the authors could not agree upon whether to include versus exclude. The main analysis output is displayed below:

### Symmetric Measures

		Value	Asymptotic Standard Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Measure of Agreement	Kappa	.860	.038	14.143	.000
N of Valid Cases		269			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

The authors met face-to-face to discuss the 13 cases for which an agreement could not be reached. Inclusion/exclusion were determined based on two scenarios: 1) miscoding (i.e., that an author had erroneously assigned 2 to a participant that ought to have been assigned 1); and 2) recall of a crowd inconsistent with the condition to which the

participant had been allocated. This discussion lasted until the authors reached agreement, resulting in the inclusion of nine and exclusion of four out the 13 participants. The complete inter-rater reliability process resulted in the agreement to include 212 and exclude 57 participants from the main analyses.

## Appendix G: Information Sheet (Study 3)



# INFORMATION SHEET

**Study Title:** Social identity, crowds and health: A cross-sectional study

### Invitation

You are being invited to consider taking part in the research study "Social identity, crowds and health: A cross-sectional study". This project is being undertaken by Daniella Hult Khazaie, a PhD candidate of Keele University (United Kingdom), and supervised by Dr Sammyh Khan and Professor Clifford Stott.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully. Ask us if there is anything that is unclear or if you would like more information.

### Aims of the Research

This study aims to investigate individuals' experiences and perceptions of a music festival.

### Why have I been invited?

You have been invited as you fulfil the study criteria - you are 18 years of age or older and from the United Kingdom (UK), and you have attended a UK music festival within the last month. Approximately 200 other participants are anticipated to complete the study.

### Do I have to take part?

You are free to decide whether you wish to take part or not. If you do decide to take part you will be asked to provide your informed consent. You are free to withdraw from this study at any time and without giving a reason. However, once you have completed the survey, you will no longer be able to withdraw your data unless you are able to provide the IP address of the device you completed the survey on. Withdrawal of data can be done within one month of submitting your data. As such, you will be able to withdraw your data on or before  $\{date://OtherDate/FL/+1\%20month\}$ .

### What will happen if I take part?

After reading this information sheet you will be asked to provide your informed consent to take part in this study if you are still happy to participate. The next step will be to read brief information about crowds and social identity. You will then be asked to think about the music festival you have recently attended and how you related to other festival-goers, and subsequently complete the survey which contains a series of questions about your experiences, perceptions and feelings at the event. This study takes approximately 15 minutes to complete.

**What are the benefits (if any) of taking part?**

There may not be any direct benefits to you of taking part. However, findings may further our understanding of the role of psychosocial factors in crowds.

**What are the risks (if any) of taking part?**

There are no foreseeable risks of taking part in this study.

**How will information about me be used?**

Participation is anonymous - your responses will be pooled with other participants' data and used for analysis. In accordance with American Psychological Association guidelines, the overall results may be submitted for publication in a scientific journal or presented at scientific conferences. Additionally, it is likely that the overall results will be included in a PhD thesis. The collected data may be retained for 5 years and used in future research studies for which ethical approval will be sought.

**Who will have access to information about me?**

All data that will be collected will be anonymous, pooled and presented in aggregate form only – therefore no participants will be identifiable. Only the principal investigator and supervisors of the research will have access to the study data. The data will be retained by the principal investigator for 5 years after completion of the study on a password-protected computer, it will subsequently be securely disposed of. The supervisors of the project will securely store the data on password-protected computers indefinitely.

**Who is funding and organising the research?**

This research project is funded by Keele University and is being organised by Daniella Hult Khazaie who has received a PhD scholarship from the university.

**What if there is a problem?**

If you have a concern about any aspect of this study, you may wish to speak to the researcher who will do their best to answer your questions. You should contact Daniella Hult Khazaie via [a.k.d.hult.khazaie@keele.ac.uk](mailto:a.k.d.hult.khazaie@keele.ac.uk) or (+44)1782 34247. Alternatively, if you do not wish to contact the researcher you may contact Dr Sammyh Khan via [s.s.khan@keele.ac.uk](mailto:s.s.khan@keele.ac.uk) or (+44)1782 733625.

If you remain unhappy about the research and/or wish to raise a complaint about any aspect of the way that you have been approached or treated during the course of the study, please write to the Research Integrity Team which is the University's contact for complaints regarding research at the following address:

Research Integrity Team  
Directorate of Research, Innovation and Engagement  
IC2 Building  
Keele University  
ST5 5NE  
Email: [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk)  
Tel: 01782 733371

Contact for further information:  
Daniella Hult Khazaie  
a.k.d.hult.khazaie@ Keele.ac.uk  
(+44)1782 34247

Version no. 1.1, June 2018

## Appendix H: Consent Form (Study 3)

### CONSENT FORM

If you wish to take part in this study, please click on the statements below if you agree with them:

- I confirm that I have read and understood the information sheet dated February 2018 (version no. 1.1) for the above study.
- I understand that my participation is voluntary and that I am free to withdraw at any time. However, once I have completed the survey, I will no longer be able to withdraw my data unless I can provide the IP address of the device I completed the survey on within one month of submission (i.e. a withdrawal request must be submitted on or before  $\text{\$}\{date://OtherDate/FL/+1\%20month\}$ ).
- I agree to take part in this study.
- I allow my anonymised data to be used for publications, conferences and future research projects.



## Appendix I: Ethical Approval Letter (Study 3)



16/07/2018

Dear Daniella

PI: Daniella Hult Khazaie

Title: The effect of shared social identity on health risk perceptions in mass gatherings

Ref: ERP3155

Thank you for submitting your application for review. The proposal was reviewed by the Panel Chair. I am pleased to inform you that your application has been approved by the Ethics Review Panel.

If the fieldwork goes beyond the date stated in your application, or there are any amendments to your study you must submit an 'application to amend study' form to the ERP administrator at [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk). This form is available via <https://www.keele.ac.uk/raise/researchsupport/projectassurance/researchethics/>

If you have any queries please do not hesitate to contact me, in writing, via the ERP administrator, at [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk) stating ERP3155 in the subject line of the e-mail.

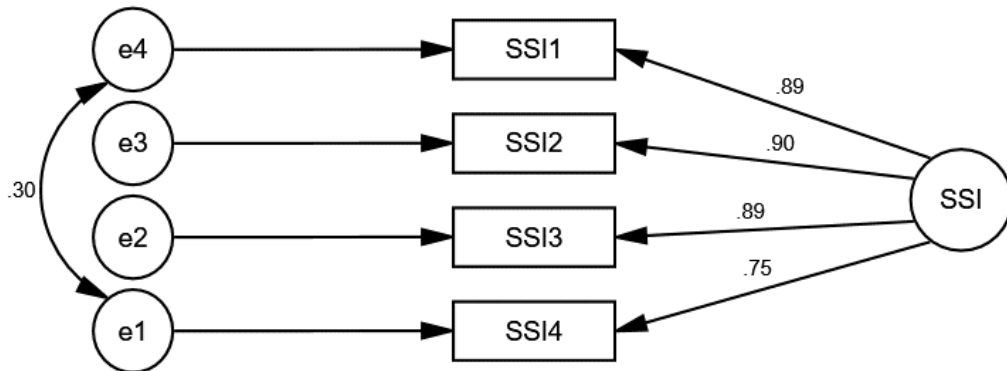
Yours sincerely  
PP.

A handwritten signature in black ink that reads "V. Amingham".

Dr Valerie Ball  
Chair – Ethical Review Panel

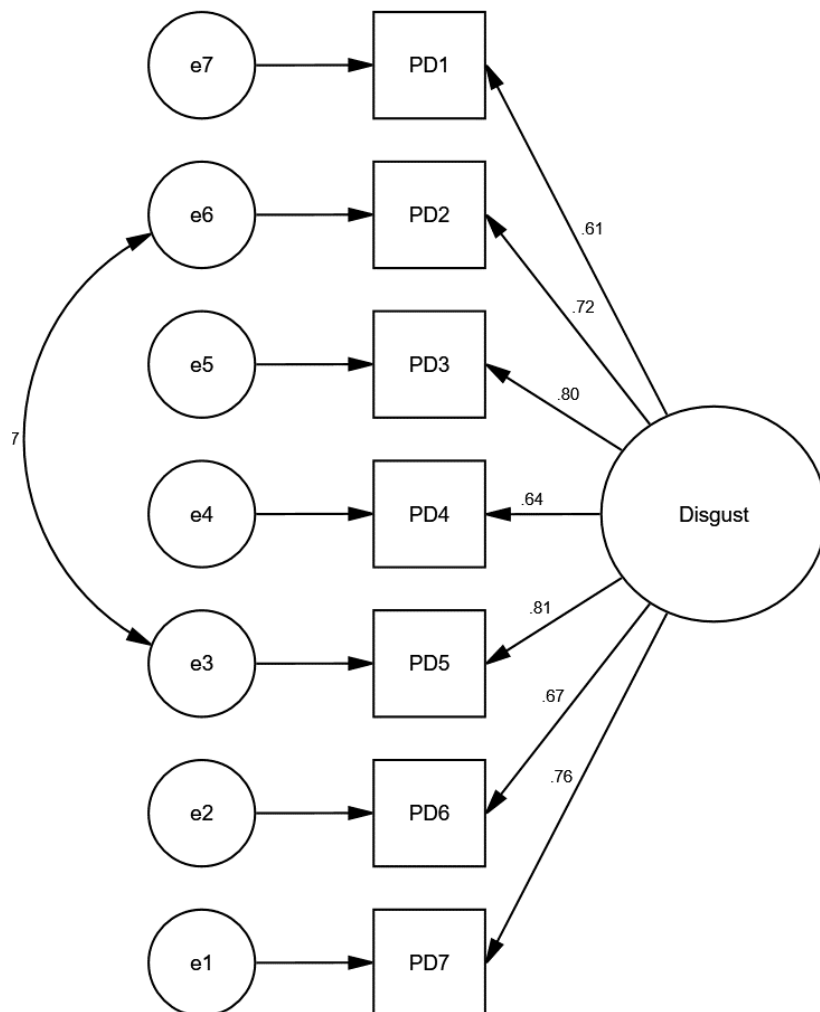
**Appendix J: Confirmatory Factor Analysis (CFA) Diagrams and Fit Indices (Study 3)**

CFA diagram of the Shared Social Identity measure (SSI)



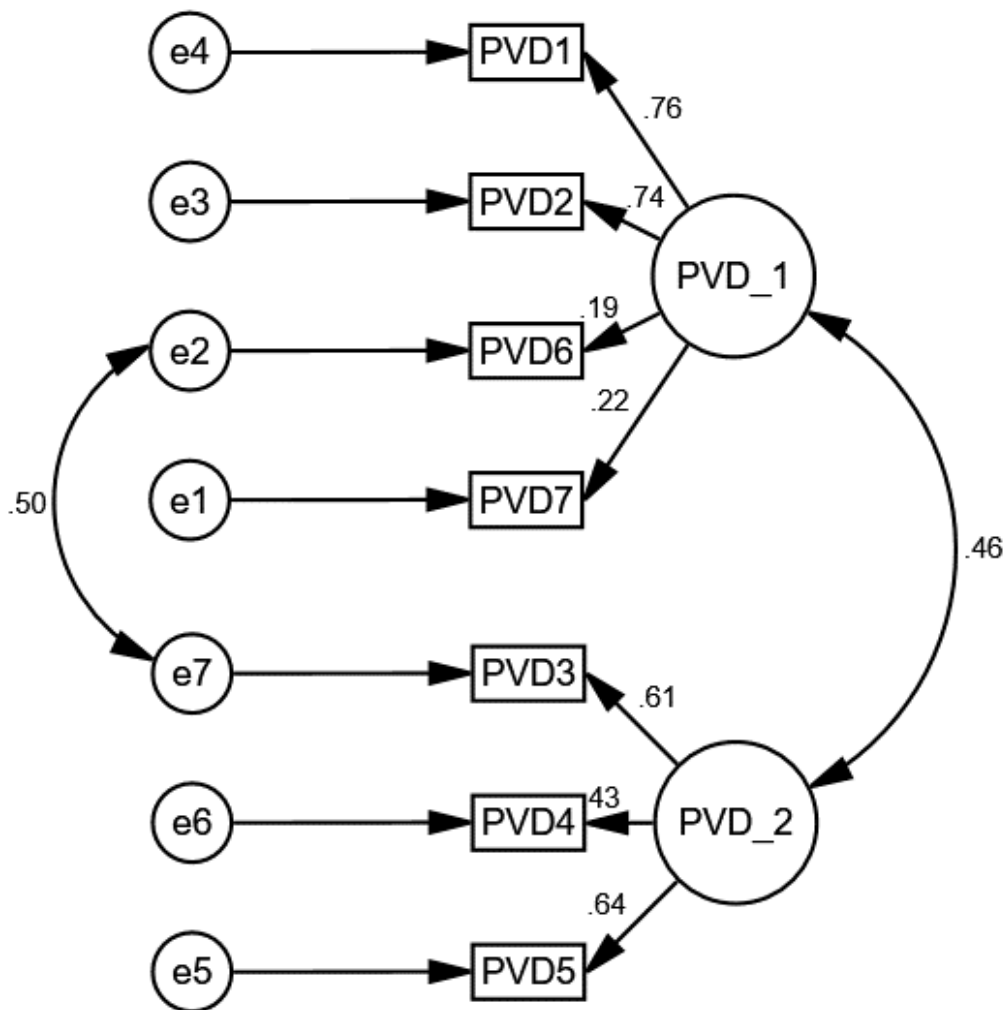
CFI = .999; SRMR = .010; RMSEA = .062;  $\chi^2 (1) = 1.568, p = .211$

CFA diagram of the Perceived Disgust measure (PD)



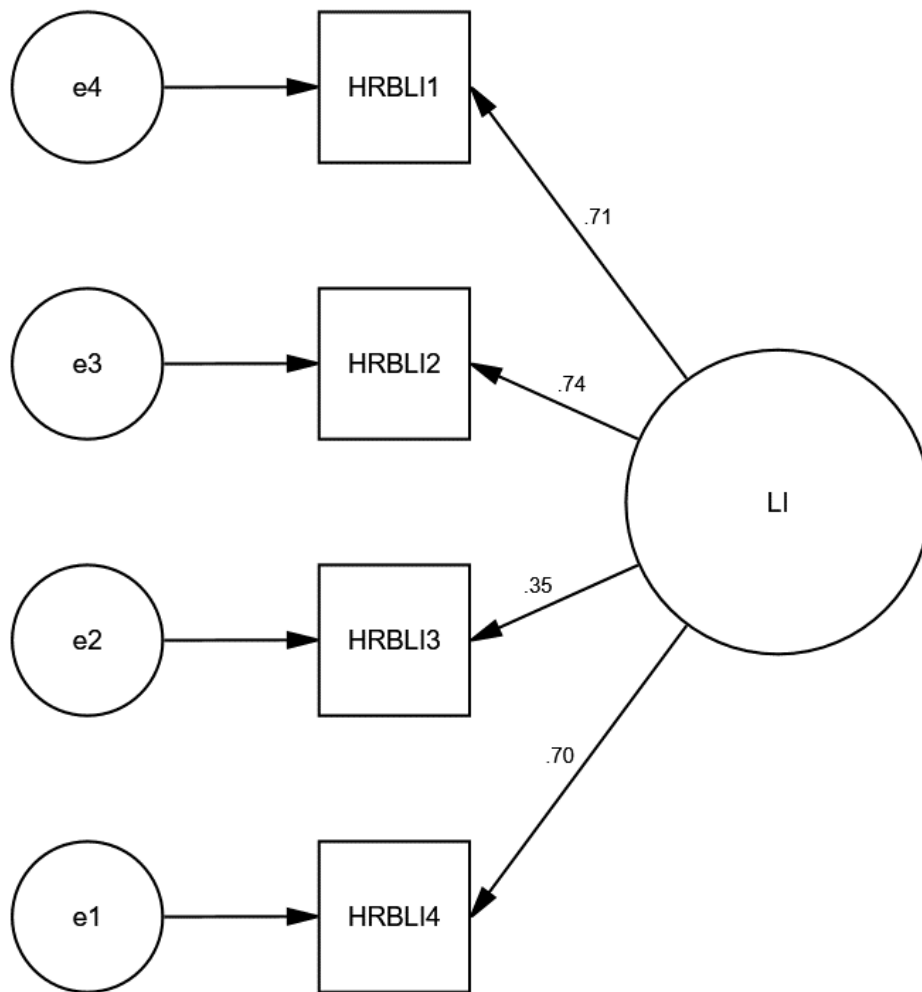
CFI = .964; SRMR = .053; RMSEA = .093;  $\chi^2(13) = 29.501, p = .006$

CFA diagram of the Perceived Vulnerability to Disease measure (PVD)



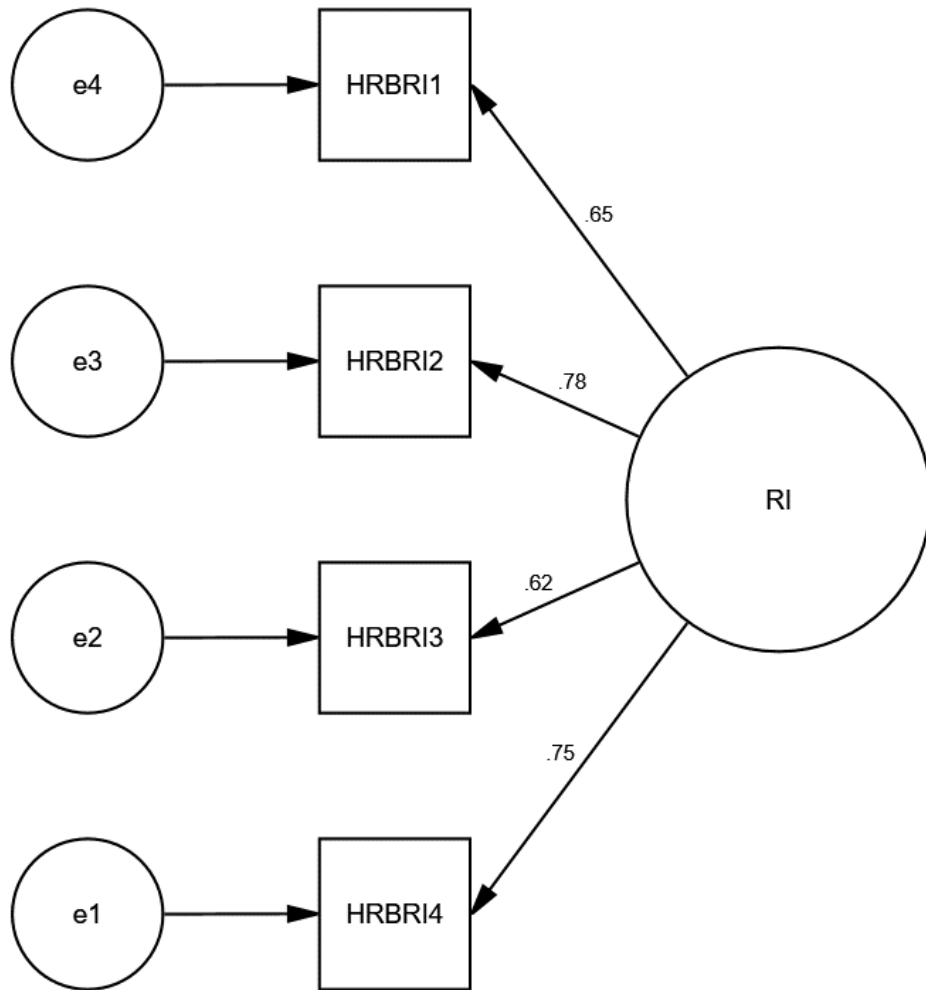
CFI = .924; SRMR = .083; RMSEA = .084;  $\chi^2(12) = 24.324, p = .018$

CFA diagram of the Likelihood to Engage in Health Risk Behaviours measure (HRBLI)



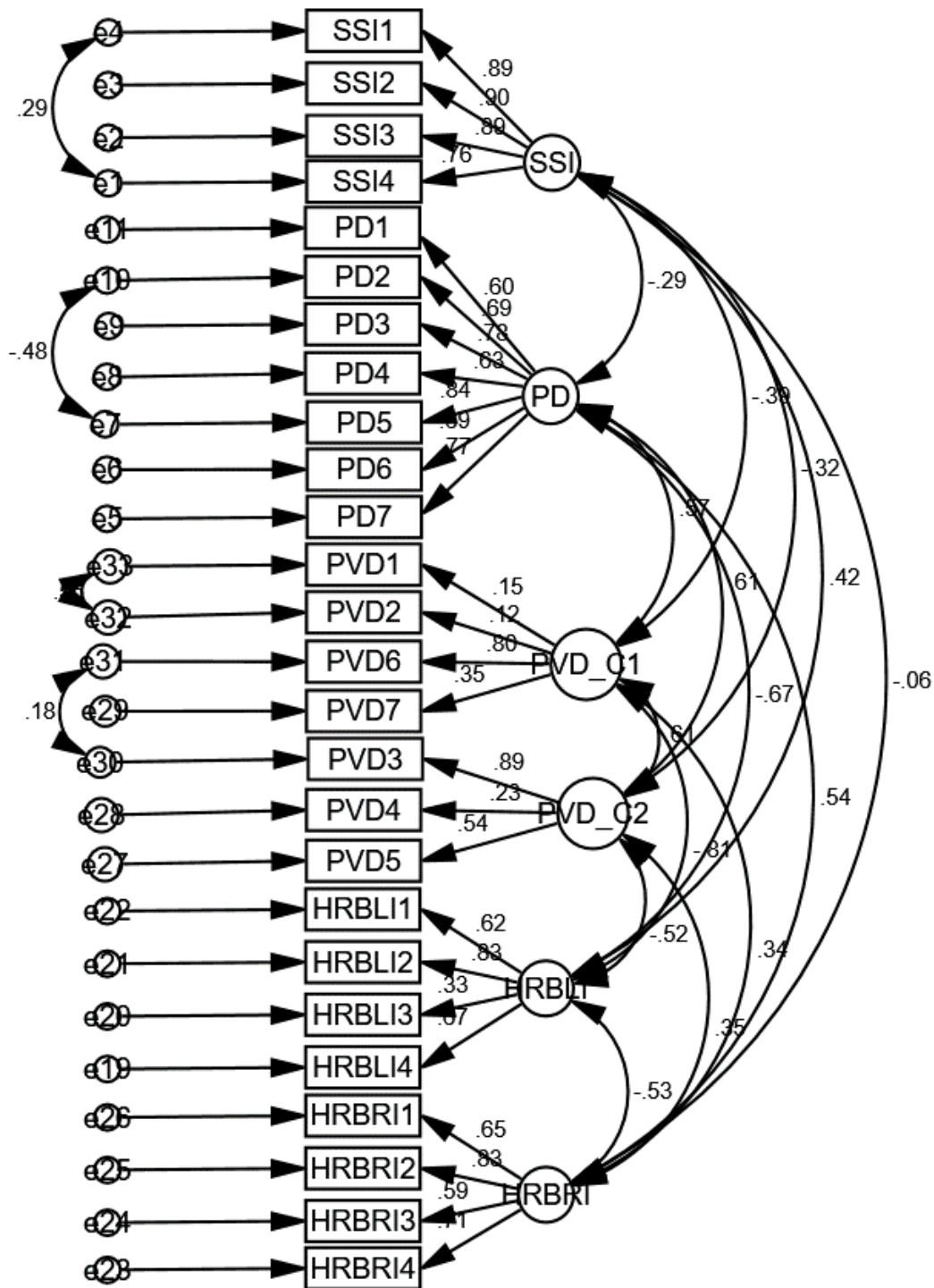
CFI = .987; SRMR = .039; RMSEA = .073;  $\chi^2(2) = 3.547, p = .170$

CFA diagram of the Likelihood to Engage in Health Risk Behaviours measure (HRBLI)



CFI = 1.000; SRMR = .022; RMSEA = .000;  $\chi^2(2) = 1.536, p = .464$

CFA diagram of all measures



CFI = .914; SRMR = .076; RMSEA = .059;  $\chi^2 (280) = 423.171, p < .001$

## Appendix K: References for All Included Studies (Study 4)

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## Appendix L: Summary of Individual Studies and Quality Ratings (Study 4)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(La Greca et al., 2001) US	To examine peer crowd affiliation and its linkages with health-risk behaviours.	Adolescents (N = 250) aged 15 to 19 years (M = 16.8; SD = .90) enrolled in grades 10 through 12.	Mixed; interview and cross-sectional.	Peer crowd identity.	Frequency of cigarette smoking, substance use, risky sexual behaviour, and general risk-taking behaviours.	Perceptions of social acceptance and friend's health risk behaviours.	'Burnouts' and 'nonconformists' had the highest rates of health-risk behaviours across the risk-domains and 'brains' the lowest. 'Populars' engaged in relatively high rates of alcohol use and 'jocks' in general and sexual risk-taking.	60% (Moderate)
(Card et al., 2017) Canada	To identify social factors predicting condomless anal sex (CAS) between online-met partners.	Sexually active gay, bisexual, and other men who have sex with men (N = 774 at baseline; N = 56 at seventh follow-up) aged ≥ 16 years.	Quantitative; longitudinal.	Collective identity with the gay/bisexual/queer community.	Last sexual encounter with five most recent partners and CAS activity.	Communal altruism, sexual sensation seeking, treatment optimism, negative self-esteem, HIV status (self and partner), social support, loneliness, hospital anxiety and depression, and cognitive escape motive.	CAS was negatively associated with collective identity and social embeddedness.	64% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Hovick & Holt, 2016) US	Explore relationships between ethnic identity and cancer-related risk factors and knowledge.	Hispanic (N = 458), Black (N = 516), and non-Hispanic White (N = 478) aged 50 years or older (M = 58.56; SD = .80).	Quantitative; cross-sectional.	Ethnic identity.	Cancer risk perception and cancer self-efficacy.	Race, physical activity, fruit and vegetable intake, BMI, cancer risk knowledge, health literacy and Cancer worry.	Ethnic identity was unrelated to cancer risk perceptions and cancer self-efficacy.	69% (Moderate)
(Brown et al., 2016) US	To obtain a variety of perspectives on American Indian/Alaska Native (AI/AN) youth identity and its associations with alcohol and other drug use (AOD).	AI/AN youth aged 14 to 18 years, parents, providers of education services, and community advisory boards. Total N = 70.	Qualitative; focus groups.	Cultural identity (AI/AN identity).	AOD use.		Disconnection from AI/AN identity and culture can lead to AOD use. AI/AN can protect against AOD use, but AI/AN community and attachment to AI/AN identity can also lead individuals to AOD use or make it more difficult for them to quit.	71% (Moderate)
(Baldwin et al., 2011) US	To investigate risk and protective factors related to alcohol and drug use among American Indian youth.	American Indian (AI) students (N = 221) aged 15 to 25 years (M = 16.3).	Mixed; interviews and longitudinal.	Cultural identity (AI and White identity).	Substance use and risky behaviour.	Stressful life events, social support, protective family and peer influence, depressed mood	Cultural identity had no direct effects on substance use or risky behaviours.	60% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Simonds et al., 2017)  US	To examine whether assignment to one of the four Risk Perception Attitude framework categories, defined by one's self-efficacy and risk perception, can predict knowledge about diabetes risk factors and stage of change for engaging in diabetes preventive behaviors.	American Indians (AI; N = 143; Mean age = 41.4 years) from a Northern Plains Tribe without a diabetes diagnosis.	Quantitative; cross-sectional.	Cultural identity (AI and White identity).	Perceptions of diabetes risk.	Self-efficacy, stages of change, knowledge of diabetes risk factors, numeracy and objective diabetes risk.	No relationship between cultural identity and diabetes risk perception.	71% (Moderate)



Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Schwartz et al., 2011) US	To examine the associations of heritage and U.S. cultural practices, values, and identifications with health risk behaviours among first- and second-generation immigrant undergraduate students from various racial/ethnic backgrounds and regions of the US.	First- and second-generation immigrant undergraduate students (N = 3251) aged 18 to 29 years (M = 20.22; SD = 3.31) with a non-Hispanic White, non-Hispanic Black, Hispanic, Asian, or Middle Eastern ethnicity.	Quantitative; cross-sectional.	Cultural identity: ethnic identity and US identity.	Hazardous alcohol use, illicit drug use, unsafe sexual behaviour and impaired driving.	Cultural practices and cultural values.	For Blacks, US identity was negatively related to illicit drug use and impaired driving, and ethnic identity was negatively related to hazardous alcohol use. For Hispanics, ethnic identity was positively related to illicit drug use and sexual risk-taking. For East Asians, US identity was positively related to hazardous alcohol use.	71% (Moderate)
(Hopmeyer & Medovoy, 2017) US	To examine associations between peer crowd affiliations, emotional connection to peers, campus community, and engagement in risk-taking behaviors.	College students (N = 588) aged 18 to 26 years (M = 20.07; SD = 1.34).	Quantitative; cross-sectional.	Peer crowd identity.	Sexual risk, drug risk, and alcohol risk.	Academic risk and loneliness.	Scholastic and athletic affiliations predicted low-risk-related behaviours whereas social and counterculture identification predicted risk-related behaviour.	48% (Low)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Wimer & Levant, 2013) US	To examine the links between masculinity constructs, the consumption of energy drinks, jock identity, and fraternity membership.	N = 589 men aged 18 to 63 years (M = 23.01; SD = 1.13).	Quantitative; cross-sectional.	Jock identity.	Energy drink consumption.	Masculinity ideology, conformity to masculine norms, gender role conflict, and fraternity membership.	Jock identity moderated the relationship between masculinity ideology and energy drink consumption. When jock identity scores are high, the positive relationship between energy drink consumption and masculinity ideology is attenuated. Conforming to masculine norms of risk-taking predicted energy drink consumption.	60% (Moderate)
(Love et al., 2006) US	To examine the relationship between ethnic identity and substance use in minority children.	Mexican-American and Latino students in Grades 8, 9, and 10 (N = 1892; Mean age = 14.6 years; SD = 1.4).	Quantitative; cross-sectional.	Ethnic identity.	Mixed use of alcohol and drugs, heavy drinking, regular marijuana use, and cigarette smoking.	Carrying weapons, lack of regular exercise, and not eating breakfast regularly	Ethnic identity was associated with being less likely to be showing mixed use of alcohol and drugs, heavy drinking, regular cigarette smoking, and regular marijuana use.	43% (Low)
(Brezo et al., 2006) US	To examine associations between ethnic identity and health attitudes toward type 2 diabetes mellitus.	African Americans with type 2 diabetes and friends/relatives (N = 37) aged 18 years or older.	Quantitative; cross-sectional.	Ethnic identity.	Perceptions of susceptibility to diabetes and awareness of risk factors for diabetes.	Diabetes history and communication.	Ethnic identity was positively correlated with knowledge of risk factors but not with perceptions of susceptibility to diabetes.	52% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Chng & Geliga-Vargas, 2000) US	To examine the association between ethnic identity and gay identity amongst multiethnic men who have sex with men and HIV risk-taking behaviours.	Multiethnic men (N = 302) who have sex with men (MSM).	Quantitative; cross-sectional.	Ethnic identity and gay identity.	HIV risk-taking behaviour.	Sexual sensation seeking and HIV status.	Ethnic identity did not predict unprotected anal sex. Participants who reported higher gay identity reported less unprotected anal sex.	74% (Moderate)
(Corneille & Belgrave, 2007) US	To examine the impact of ethnic identity on drug and sex attitudes among early adolescents.	African American female adolescents (N = 175) aged 9 to 15 years (M = 11.54; SD = 1.31).	Quantitative; cross-sectional.	Ethnic identity.	HIV self-efficacy and drug attitudes and intentions.	Menarche, household structure and neighbourhood risk.	Higher ethnic identity was associated with higher sexual refusal efficacy, disapproval of drug use, and lowered intentions to use drugs.	48% (Low)
(Govender et al., 2015) South Africa	To explore first-year students' opinions and experiences regarding their use of alcohol.	First-year undergraduate students (N = 217).	Qualitative; open-ended questionnaire and focus groups.		Alcohol beliefs.		Social identity and peer pressure are motivating factors in students' use of alcohol.	40% (Low)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Livingstone & McCafferty, 2015) UK	To test the role of group identification and the perceived importance of alcohol consumption to group identity in shaping reactions to normative information about alcohol consumption.	Undergraduate students (N = 83) aged 18 to 48 years (M = 21.28; SD = 3.95).	Quantitative; experimental.	Student identity.	Personal attitudes towards alcohol/caffeine consumption, perceived importance of alcohol/caffeine consumption to group identity, and behavioural intentions to consume alcohol/caffeine.		Intended alcohol consumption was greater in the heavy norm condition than in the moderate norm condition. Personal attitude and group identification moderated the impact of norm information on alcohol consumption.	62% (Moderate)
(Koesten et al., 2002) US	To examine perceived family communication culture, social identity, development of communicative self-efficacy, and reported risk behaviours for adolescent girls.	Women (N = 25) aged 18 to 20 years (M = 18.9).	Qualitative; interviews.		Reported risk behaviours (Cigarette smoking, alcohol use, risky sex, and drug use).	Family communication culture and development of communicative self-efficacy	High risk-takers conformed to their peers' risky behaviours in fear of otherwise being rejected.	57% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Sani et al., 2015) UK	To examine the relationship between group identification and different health behaviours.	Adults (N = 1824) aged 18 to 97 years (M = 57.55; SD = 14.57).	Quantitative; cross-sectional.	Group identification.	Self-reported health behaviour frequencies (smoking, drinking, physical exercise, and diet).	Group contact frequencies (family, local community, and chosen group).	The greater the number of social groups with which participants identified, the healthier their behaviour on any of the four health dimensions.	76% (High)
(Miller et al., 2016) UK	To examine the relationship between group identification and adolescent health behaviours.	High school students (N = 1111) aged 13 to 17 years (M = 15.07; SD = .97).	Quantitative; cross-sectional survey.	Group identification with the family, school, and friendship groups.	Health behaviours (smoking, binge drinking, and cannabis use).	Group contact (family, school, and friends).	Identification with the family and school groups predicted reduced odds of substance use, whereas identification with the friendship group predicted increased odds of substance use. The greater the number of social groups participants highly identified with, the lower the odds that they participated in negative health behaviours.	64% (Moderate)
(Kipke et al., 1997) US	To identify sub-peer groups in homeless youth and determine whether these groups differ regarding drug use patterns and HIV risk.	Homeless youth (N = 303) aged 13 to 23 years (M = 19.0).	Quantitative; cross-sectional.	Peer group affiliation.	Alcohol and other drug use and HIV risk behaviours.	Peer pressure.	'Punks'/'gay/bisexuals' were more likely to have a substance use disorder and found it more difficult to resist peer pressure. Punks were at increased risk for having unprotected sex and sharing needles.	71% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(McLeod et al., 2008) Australia	To explore the social context of smoking experimentation and consolidation.	Adult identical twin pairs (N = 14) aged 27 to 33 years who were discordant for smoking status since adolescence.	Qualitative; interviews.		Smoking.	Peer pressure.	Smokers reported exposure to smoking peers and engaging in smoking to construct or change their social identities and thereby express certain parts of themselves.	48% (Low)
(Corstie-Massay et al., 2017) US	To explore the associations between ethnic group, ethnic identity, sexual pride, and likelihood of engaging in sexual risk-taking among men who have sex with men (MSM).	Young Black and Latino MSM (N = 161) aged 18 to 30 years (M = 24.5; SD = 3.5).	Quantitative; cross-sectional.	Ethnic identity, sexual pride (sexual identity/gay identity integration) and identification with ethnic group.	Sexual risk-taking (instances of condomless anal sex with non-primary partners).		Sexual pride negatively predicted sexual risk-taking, moderated by ethnic exploration and ethnic group; the relationship between sexual pride and sexual risk-taking was strengthened by greater ethnic exploration among Latinos and weakened by greater ethnic exploration among Blacks.	62% (Moderate)
(Beaupre et al., 2015) US	To explore ethnic and adoptive Korean identity profiles and their relationships to psychological adjustment.	Adopted Korean American adolescents (N = 189; Mean age = 15.59 years; SD = 1.78).	Quantitative; cross-sectional.	Ethnic identity and adoptive identity.	Alcohol, recreational drugs, and cigarette use.	Parental/adolescent ethnic socialisation, behavioural development, satisfaction with life, school adjustment, and family functioning.	Adoptive nor ethnic identity were related to risk behaviours.	48% (Low)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Willoughby et al., 2008) US and Canada	To examine the existence of gay peer crowds and how these peer crowds may be differentially related to health risk.	Self-identified gay men (N = 340) aged 17 to 78 years (M = 35.11; SD = 11.32).	Quantitative; cross-sectional.	Gay peer crowd identity.	Health risk behaviours (substance use, smoking, risky sex, and steroid use).		Identifying with Circuit Partiers, Bears, Muscle Boys, Granolas, and Goths was related to adverse health behaviours. Low-risk included Suburbans, Professionals, Twinks, and Activists.	67% (Moderate)
(Jordan et al., 2019) US	To examine the relationship between crowd identification and risk behaviours.	Students in Grades 9 to 12 (N = 4367).	Quantitative; cross-sectional.	Peer crowd identity.	Tobacco, alcohol, and illicit drug use.	Safety behaviours, violence, bullying, depression, suicide, weight, nutrition, and physical activity.	Hip Hop crowd identification was associated with substance use, Alternative with increased risk for substance use, whereas Mainstream and, to a lesser extent, Popular, identities were associated with decreased risk for most behaviours.	71% (Moderate)
(Stapleton et al., 2008) US	To examine the relationship between peer crowd identification and indoor tanning behavioural tendencies.	Undergraduate students (N = 174; Mean age = 19.83 years; SD = 1.28).	Quantitative; cross-sectional.	Peer crowd identity.	Indoor tanning behavioural tendencies (UV tanning).	Tanning attitudes and normative beliefs.	Identification with populars was positively associated with normative UV tanning beliefs, tanning attitudes, last year usage, and intention to use. Identification with brains was protective.	48% (Low)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Mosbach & Leventhal, 1988) US	To examine the relationship between cigarette smoking and peer group affiliation.	Seventh and eighth graders (N = 353).	Quantitative; cross-sectional.	Peer crowd affiliation.	Smoking and alcohol consumption.	Social behaviours, self-esteem and life satisfaction, excitement seeking and risk-taking, and dissatisfaction and frustration with own performance.	Hot-shots and dirts were high users of tobacco and alcohol, and the jocks and regulars were low users.	64% (Moderate)
(Sussman et al., 2004) US	To examine the association between peer group affiliation during high school and psychosocial functioning five years later.	Continuation high school students (N = 952 at baseline; N = 532 at 5-year follow-up). Age ranged from 19 to 24 years (M = 22; SD = .8).	Quantitative; longitudinal.	Peer group affiliation.	Drug use, drug problem, drug consequence, drug-related driving.	Young adult life circumstances, violence perpetration and victimisation, and depression.	“High risk” youth and “others” reported higher levels of drug use and related issues than did “hot shots” and “regulars.”	71% (Moderate) US



Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Chae & Yoshikawa, 2008) US	To examine depressive mood and HIV-risk behavior in relation to perceived group devaluation and group identity.	Asian gay men (N = 192) aged 18 years or older.	Quantitative; cross-sectional.	Dimensions of group identity (ethnic and sexual identity): Private Collective Self-Esteem (CSE), Importance to Identity, and membership CSE.	Frequency of unprotected anal intercourse (UAI) with primary and nonprimary partners.	Depressive mood, perceived racial group devaluation, and racial attraction.	Greater importance to identity was positively associated with total UAI. Negative association between perceived group devaluation and total UAI was more negative among participants with more positive Private CSE. Under conditions of positive Membership CSE, perceived group devaluation was negatively associated with total UAI.	62% (Moderate) US
(Louis et al., 2007) Australia	To examine the role of student identity and group norms in healthy and unhealthy eating.	University students (N = 137 at wave 1; N = 116 at wave 2) aged 17 to 54 years.	Quantitative; longitudinal and experimental.	Identification as a student at the university.	Attitudes, norms, intentions, behaviour, perceived behaviour control, and experimenter observation.		Low identifiers were unresponsive to referent group norms for healthy eating, whereas high identifiers conformed to perceived norms to eat unhealthily or healthily.	62% (Moderate)
(Elliott, 2010) UK	To identify cognitive predictors of motorcyclists' speeding intentions.	Motorcyclists (N = 110) aged 22 to 64 years (M = 46.64; SD = 9.13).	Quantitative; cross-sectional.	Group identity (as a motorcyclist).	Intention to speed, perceived group norm of speeding	Affective attitude, perceived controllability, and self-identity.	Group identification and perceived group norms, and an interaction between group norms and group identification were significant predictors of intention to speed.	79% (High)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Reisner et al., 2009) US	To investigate the demographic, psychosocial, and behavioral predictors of barebacker identity.	Men who have sex with men (N = 227; Mean age = 40.84 years; SD = 9.10).	Quantitative; cross-sectional.	Barebacker identity.	Sexual risk behaviour, substance use, and condom use norms.	Depressive symptoms, sexual behaviour/sexual partner history, sexually transmitted infection history, and HIV treatment optimism.	Drinking problem and engaging in sexual risk behaviour predicted barebacker identification compared to those with no barebacker identification. Barebackers were also more likely to screen in for alcohol abuse and engage in sexual risk behaviour than non-barebackers. Condom use norms were not associated with barebacker identity.	71% (Moderate)
(Walker et al., 2015) US	To explore the ways in which racial and sexual identities may serve as buffers to risky sexual behavior.	Self-identified Black gay and bisexual men (N = 120) aged 18 to 29 years (M = 21.79; SD = 3.08).	Quantitative; cross-sectional.	Racial identity and sexual identity.	Sexual behaviours.		Racial identity was associated with fewer unprotected anal sex acts but sexual identity was not related to sexual behaviours.	64% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Stock et al., 2013) US	To examine racial identity as a protective factor against substance-related cognitions and substance use among Black adolescents and young adults.	Study 1: Black adolescents (N = 720) aged 10 to 12 years at wave 1.  Study 2: Black young adults (N = 203; Mean age = 21.5 years; SD = 1.9).	Study 1: Quantitative; longitudinal.  Study 2: Quantitative; cross-sectional.	Racial identity.	Substance use, alcohol use, and willingness to use substances in different scenarios.	Neighbourhood characteristics, perceived friends' use, substance user image, primary caregiver, self-concept, effective parenting, substance availability, Black peer environment, and self-esteem.	Racial identity was associated with lower levels of perceived friends' use and lower favourability of the substance user prototype and, in turn, lower substance willingness and use, but only among Black adolescents in predominantly White neighborhoods. Low racial identity participants who reported predominantly White peer environments reported the highest levels of alcohol use.	76% (High)
(Stock et al., 2011) US	To examine racial identity as a protective factor against substance use cognitions among African American young adults who either envisioned or experienced racial discrimination.	Study 1: Black young adults (N = 64).	Quantitative; experimental.	Racial identity.	Drug use, willingness to use drugs in different scenarios, and scenario substance use risk.	Supportive parenting, self-concept and perceived stress.	Participants with higher racial identification reported lower willingness to use drugs. Among participants in the discrimination condition, those with lower racial identification reported higher willingness to use drugs and scenario-based risk.	55% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Shehadeh & McCoy, 2014) US	To examine associations between ethnic identity and high-risk sexual behaviours.	African American and Hispanic migrant workers (N = 431 at baseline; N = 270 at follow-up).	Quantitative; longitudinal.	Ethnic identity.	HIV risk behaviours, drug use, and alcohol consumption.		Lower ethnic identity at baseline was associated with higher sexual risk and alcohol consumption.	79% (High)
(Espinosa-Hernández & Lefkowitz, 2009) US	To examine ethnic differences in sexual behaviours and attitudes, and associations between ethnic identity and sexual behaviours and attitudes.	African American, European American, and Latino American first-year college students (N = 434) aged 17.5 to 19.8 years (M = 18.5; SD = .4).	Quantitative; cross-sectional.	Ethnic identity.	Risky sexual behaviour and sexual attitudes.	Family socioeconomic status.	Ethnic identity was a protective factor against risky sexual attitudes, but for sexual behaviours, ethnic identity was only a protective factor for European Americans.	67% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Phillips et al., 2007) UK	To explore the accounts of smokers and non-smokers (who live with smokers) of smoking in their homes and cars after the Scottish smoke-free legislation and to examine the reported impact of the legislation on smoking in the home.	Adults aged 18 to 75 years (N = 50).	Qualitative; interviews.		Attitudes and strategies used to regulate smoking in the home.		Respondents' accounts were underpinned by normative discourses of acceptable social identities; i.e., being seen to be a "considerate" smoker or non-smoker who would appropriately modify their behaviour or restrictions for family and friends or on certain special occasions.	52% (Moderate)
(Zhou et al., 2016) UK	To examine longitudinally the relationships among sports-related identities, well-being, and alcohol behaviors in those participating in sports.	University sportspeople (N = 475 at baseline with a mean age of 20.22 years (SD = 2.44); N = 92 at follow-up with a mean age of 20.83 years (SD = 2.21).	Quantitative; cross-sectional and longitudinal.	Athlete identity and sports group identity.	Alcohol consumption and drinking motives (positive reinforcement, team/group, and sport-related coping).	Well-being.	Sports group identification and alcohol consumption were positively correlated, and this relationship was mediated by positive reinforcement drinking motives. Higher alcohol consumption reported at baseline positively correlated with greater sports group identification at follow-up.	69% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Mimiaga et al., 2008) US	To examine the degree to which group identity and norms among participants of a HIV-prevention trial was associated with high-risk sexual intentions and behaviour.	Men who have sex with men partaking in a HIV-prevention trial (N = 271; Mean age = 37.12 years; SD = 9.34) .	Quantitative; cross-sectional.	Group membership and group identity.	Intentions to engaging in risky sexual behaviour with other trial participants, and actual behaviour.	Norms.	Group identity and norms were not predictive of risky sexual behaviour or intentions to engage in these.	71% (Moderate)
(Frank et al., 2015) US	To examine the roles of identification with characters and narrative involvement on perceived response efficacy, perceived severity, and perceived susceptibility to HPV and behaviour	Adult women (N = 353; Mean age = 38 years (SD = 5.8).	Quantitative; longitudinal.	Identification with presented characters.	Response efficacy of HPV vaccination, perceived severity of HPV, and perceived susceptibility of catching HPV.	Narrative involvement.	At 2 weeks, identifying with characters was positively associated with perceived susceptibility to HPV but negatively associated with perceived severity. At 6 months, identification with specific characters was significantly associated with perceived threat and behaviour.	74% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Walker et al., 2018) US	To examine peer crowd identification and cigarette smoking status.	Adolescents (N = 5153) aged 13 to 17 years.	Quantitative; cross-sectional.	Peer crowd identity.	Cigarette smoking behaviour and susceptibility.		Alternative youth were most at risk of cigarette smoking, followed by Hip Hop. Specifically, Hip Hop youth were significantly less likely to be Non-susceptible Non-triers than Popular, Mainstream, and Country youth, and more likely to be Experimenters than Popular and Mainstream youth.	60% (Moderate)
(Shehadeh et al., 2012) US	To examine associations between ethnic identity and short-term changes in high-risk sexual behaviour.	African American and Hispanic migrant workers (N = 119).	Quantitative; longitudinal.	Ethnic identity.	Sexual risk behaviour.		Lower ethnic identity was associated with higher levels of positive change in relation to HIV/AIDS risk behaviour.	55% (Moderate)
(Nasim et al., 2007) US	To examine whether Africentric beliefs, religiosity, and ethnic identity were promotive or protective for alcohol initiation and use.	African American adolescents (N = 114) aged 13 to 20 years (M = 16.9; SD = 1.71).	Quantitative; cross-sectional.	Ethnic identity.	Alcohol initiation and use.	Peer risk behaviours, Africentric beliefs, and religiosity.	High ethnic identity exhibited a protective effect on heavy alcohol consumption.	62% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Tunnick et al., 2011) Australia	To explore the social context in which riders make their safer and riskier decisions on the road.	Active motorcycle riders (N = 41) aged 18 to 65 years.	Qualitative; focus groups.		Riding behaviours (safe and risky).		Although the influence of group riding was seen as both positive and negative, the evidence mostly suggested that other riders may influence more negative, unsafe behaviours, such as speeding.	83% (High)
(Scott-Parker et al., 2009) Australia	To investigate the relationships between risky driving and Akers' social learning theory, social identity theory, and thrill-seeking variables.	Licensed young drivers (N = 165) aged 17 to 24 years (M = 19.65; SD = 2.10).	Quantitative; cross-sectional.	Group identity.	Self-reported risky driving behaviour.	Driving exposure, thrill-seeking, personal attitudes towards driving, differential association, anticipated punishment, anticipated rewards, and imitation of parents and peers.	There was a strong positive correlation between risky driving and group identity. Risky driving was not predicted by group identity in the full sample, but it was predicted by group identity for females.	81% (High)
(Lennon et al., 2005) Australia	To examine the social identities that might influence young women's smoking behaviour.	Young women smokers, ex-smokers, and non-smokers aged 16 to 28 years.	Qualitative; focus groups and interviews.	Social identity.	Cigarette smoking behaviour.		The 'cool' smoker identity influenced initial smoking experimentation but not later in life.	45% (Low)



Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Verkooijen et al., 2007)  Denmark	To examine direct association between adolescents' group identity and substance use, as well as the mediating role of perceived group norms.	Adolescents (N = 3956) aged 16 to 20 years (M = 18.0; SD = 1.42).	Quantitative; cross-sectional.	Peer group identity.	Smoking status, marijuana use, drinking to intoxication, and perceived group norms regarding smoking and marijuana use.	Time spent with peers.	Identification with the pop, skate/hip-hop, techno, and hippie subgroups was associated with higher risks of substance use, whereas identification with the sporty, quiet, computer nerd, and religious subgroups was associated with lower risks. Perceived group norm mediated the group identity–substance use relationship. Identification with multiple groups with corresponding norm increased norm-consistent substance use, whereas identification with multiple groups with opposing norms reduced normative behaviour.	71% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Schofield et al., 2003) Australia	To assess for models proposed to predict future smoking.	Young adults who had experience of smoking (N = 1548 at baseline; N = 1423 at wave 1; N = 1379 at wave 2).	Quantitative; longitudinal.	Group identity.	Smoking involvement, peer group norm, subjective norm, behavioural intention, global attitude, and personal experience of smoking.	Self-efficacy.	The smoking norm of the main peer group had greater impact on the person's actual smoking involvement and smoking-related cognitions among those who highly identified with their peer group than among the weak identifiers.	74% (Moderate)
(Lee et al., 2014) US	To examine associations between peer crowds and smoking amongst.	Black young people (N = 599) aged 13 to 20 years.	Quantitative; cross-sectional.	Peer crowd identity.	Smoking and related attitudes.		Participants who identified with the hip hop crowd were more likely to smoke and less likely to hold anti-tobacco attitudes than those identifying with preppy or mainstream crowds.	67% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Banas et al., 2016)  Australia and US	To examine the effect of exposing individuals to a norm relating to the healthiness of their social group on food choices and food intake.	Study 1: Australian first-year psychology students (N = 87; Mean age = 19.7 years; SD = 5.6).  Study 2: Female first-year psychology students (N = 117; Mean age = 18.9; SD = 3.43).  Study 3: American females (N = 117) aged 20 to 69 years (M = 41.5).	Quantitative; experimental.	Group identity (national identification as an Australian, female identification, and American identity).	Food choice from menu, group-specific norms, and amount of food eaten in a taste test.	Restrained eating and healthy eating intentions, value of health, healthy self-concept, and group goal.	Higher identifiers chose higher energy food and ate more food in a taste test when presented with information about their ingroup members behaving healthily.	67% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(McGhie et al., 2012) Australia	To examine the influence of psychosocial factors upon individuals' intentions to drink walk.	University students (N = 151) aged 17 to 30 years (M = 21.59; SD = 3.35).	Quantitative; experimental.	Level of identification with other pedestrians (friends).	Level of conformity to what other pedestrians were doing (risky behaviour or not) and drink walking intentions.		Participants reported the highest intentions to drink walk when in the presence of friends (i.e., high group identity) and their friends were said to be also crossing against the red man signal (i.e., high conformity).	76% (High)
(Stapel et al., 1994) UK	To evaluate the predication that defining the targets of an accident as ingroup members will enhance the perceived risk of such accidents.	Undergraduate physics students (N = 112) aged 18 to 21 years.	Quantitative; experimental.		Perceived probability of car accidents (general likelihood estimate and for oneself) and frequency of car accidents.	Personal involvement in car accidents.	Ingroup information had a consistent and strong effect in terms of increasing perceived risk.	55% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Wu et al., 2015) China	To examine ingroup derogation.	Study 1: Chinese undergraduate and postgraduate students (N = 60) aged 17 to 30 years (M = 23.2; SD = 2.73).  Study 3: Chinese undergraduate and postgraduate students (N = 30) aged 19 to 27 years (M = 22.6; SD = 2.18).	Quantitative; experimental.		Perceived vulnerability to disease and willingness to work with ingroup/outgroup member presented in a photo.		Perceived vulnerability to disease was positively correlated with ingroup derogation. The participants were more likely to reject an ingroup member when it was infected with diseases, but no such effects were observed for outgroup members.	48% (Low)
(Navarrete & Fessler, 2006) US	To explore the relationship between disease threat and intergroup attitudes.	Study 1: US citizens (N = 90) aged 18 to 61 years (M = 26.4; SD = 9.6).  Study 2: US citizens (N = 254) aged 18 to 64 years (M = 25.2; SD = 9.3)	Quantitative; cross-sectional (Study 1) and experimental (Study 2).	Patriotism (American identity)	Perceived vulnerability to disease.	American ethnocentrism, fear of death, and disgust.	Ethnocentric attitudes increased as a function of perceived disease vulnerability. In-group attraction increased as a function of disgust sensitivity.	69% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Tarrant & Butler, 2011) UK	To examine the effects of self-categorization on people's orientation towards health.	Study 1: British university students (N = 50; Mean age = 19.84 years; SD = 1.57).	Quantitative; experimental.		Orientation and intention towards alcohol consumption and salt intake.		Participants encouraged to self-categorise in terms of their student identity reported weaker intentions to engage in the health promotion behaviours in the future than did those encouraged to self-categorise in terms of their national identity.	64% (Moderate)
(Johnston & White, 2003) Australia	To test a social identity theory/self-categorization theory approach to the role of norms in university students' binge-drinking, using the theory of planned behaviour as a framework.	First year undergraduate students (N = 289 wave 1; N = 223 wave 2) aged 18 to 59 years (M = 26 years; SD = 9.66).	Quantitative; longitudinal.	Ingroup identification (social identification with friends and peers at university).	Intentions to binge drink (wave 1), binge-drinking behaviour (wave 2), and attitude toward binge-drinking	Feelings of belongingness, Subjective group norm and self-efficacy in relation to binge drinking.	The effect of group norm on students' intention to binge drink was moderated by group identification, whereby the effects of norms were more important for participants who highly identified with the reference group.	62% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Berger & Rand, 2008) US	To examine whether campaigns that link risky health behaviours to avoidance groups can enhance the health of populations.	Study 1: Undergraduate students (N = 50). Study 2: First-year university students (N = 87). Study 3: University students (N = 75).	Quantitative; experimental.		Food choice, alcohol consumption, and perceptions of how frequently different campus groups drink.	Ratings of whether participants would want others to think that they were akin to members of different campus groups and self-monitoring	Associating junk food with an outgroup led participants to make healthier choices. Outgroup signaling decreased alcohol consumption.	55% (Moderate)
(Livingstone et al., 2011) UK	To examine tendencies to include or exclude two target ingroup members, one a heavy drinker and the other a non-drinker.	Undergraduate students (N = 115; Mean age = 20.07 years; SD = 2.36).	Quantitative; experimental.	Student identity.	Attitudes to heavy drinking and intentions to drink heavily.	Tendencies to enforce the ingroup norm and socially include/exclude target ingroup members (regular drinker vs. non-drinker).	High identifiers reported stronger drinking intentions, and stronger tendencies to differentially place social pressure on a non-drinker, but only when the prevailing norm was for moderate drinking. Low identifiers displayed similar patterns, but only when the prevailing norm was for heavy drinking	60% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Reed et al., 2007) US	To examine the moderating influence of group identity on the relationship between injunctive norms and drinking behavior.	Undergraduate students (N = 620; Mean age = 20.27).	Quantitative; cross-sectional.	Social identity (identification with friends, university peers, and members of Greek-letter organisations).	Alcohol consumption.	Injunctive norms.	Stronger identification was associated with heavier drinking. Participants' perceptions of their friends' acceptability of their heavy drinking was positively associated with alcohol consumption. Among high identifiers, perceptions of heavy drinking acceptability were positively associated with greater alcohol consumption.	76% (High)
(Neighbors et al., 2010) US	To examine whether group identification moderates the associations between perceived drinking norms in the group and one's own drinking.	University students (N = 3752)	Quantitative; cross-sectional.	Social identity (identification with typical student, same sex, same race or ethnicity, same Greek status).	Alcohol consumption.	Descriptive norms.	Greater identification was associated with stronger relationships between perceived drinking group norms and own drinking.	71% (Moderate)



Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Chae et al., 2008) US	To examine history of alcohol abuse/dependence disorder in relation to unfair treatment, racial/ethnic discrimination, and ethnic identification among Asian Americans.	Asian Americans (N = 2073).	Quantitative; cross-sectional.	Ethnic identity.	Alcohol abuse/dependence disorder.	Racial/ethnic discrimination and unfair treatment.	Participants who reported high levels of ethnic identification had approximately half the odds of having a history of alcohol disorder compared to low identifiers.	57% (Moderate)
(Sessa, 2007) US	To examine the relation between self-reported alcohol use and perceived peer crowd norms for alcohol use among college students.	College students (N = 207) aged 17 to 22 years (M = 18.53; SD = .81).	Quantitative; cross-sectional.	Peer crowd affiliation.	Alcohol use.	Perceived alcohol use norms of specific peer crowds.	Participants reported higher use by their peer crowd compared with themselves and tended to overestimate their peer crowd's amount (except deviants and normals) and frequency (except jocks and loners). Jocks, deviants, and populars reported the highest levels of alcohol use and frequency of drinking. Normals and loners reported significantly less frequency and use – Brains reported lowest levels overall.	60% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Miller, 2008) US	To examine links among sport-related identity, endorsement of conventional masculine norms, risk-taking, and energy-drink consumption.	Undergraduate students (N = 795).	Quantitative; cross-sectional.	Jock identity.	Energy drink consumption and general risk-taking behaviour.	Endorsement of masculine norms.	Strength of jock identity was positively associated with frequency of energy-drink consumption; this relationship was mediated by both masculine norms and risk-taking behaviour.	48% (Low)
(Wagner et al., 2002) Mexico	To explore drug use in Mexican rural communities and its relationship to social cohesion, cultural identity, migration, and transculturation.		Qualitative; direct observation, interviews.	Cultural identity.	Drug use.	Social cohesion, migration, and transculturation.	Rural communities where there was little or no drug use among its members show more social cohesion, cultural identity, and community links consolidation.	29% (Low)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Sussman et al., 1994) US	To examine longitudinal relations between group self-identification and adolescent cigarette smoking.	American youth (N = 931).	Quantitative; longitudinal.	Group identity.	Cigarette smoking.	Latchkey status, family conflict, susceptibility to peer social influence to smoke cigarettes, peer social influence to smoke cigarettes, perceived stress, risk-taking, and self-esteem.	Group identification predicted later smoking, suggesting non-smokers come to identify with certain groups and subsequently begin smoking. Group self-identification is a good or better predictor of later smoking than six of seven psychosocial variables.	64% (Moderate)
(Sussman et al., 1990) US	To test whether dirts and hot-shots were most likely to use cigarettes, and whether jocks were most likely to use smokeless tobacco.	Seventh (N = 340) and tenth-grade (N = 615) high school students.	Quantitative; cross-sectional.	Peer group affiliation.	Tobacco use.		Dirts reported the highest current cigarette smokers and trial-behaviour. Hot-shots were least likely to be current smokers. Skaters were next most likely to be current smokers. Although jocks were as likely as dirts and skaters to try smokeless tobacco, the skaters were most likely to be current users.	55% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Lloyd et al., 1997) UK	To explore the nature of adolescent girls' social representations of cigarette smoking, and the construction of their social identities in relation to smoking.	Pupils in Years 7 to 11 (Questionnaire; N = 3521) and Years 7, 4, and 9 (group sizes varied from two to six girls).	Mixed; two-wave survey and an impression formation task followed by focus groups.	Social identity.	Smoking behaviour.	Body image and eating, stress and coping, home environment, and peer relations.	Smokers view smoking as a way to develop an adult social identity.	52% (Moderate)
(Lisha et al., 2016) US	To examine social affiliation with peer crowds as a way to identify high-risk tobacco users.	Young adult bar patrons (N = 3368)	Quantitative; cross-sectional.	Peer crowd affiliation.	Use rates of tobacco products.	Race/ethnicity.	Peer crowd affiliation with Hip Hop and Hipster peer crowds reported higher rates of tobacco use.	64% (Moderate)
(Parsons & Bimbi, 2007) US	To assess the prevalence of barebacker identity and determine factors related to having a barebacker identity	Gay/bisexual men (N = 687) aged 18 to 80 years (M = 36.2; SD = 10.17).	Quantitative; cross-sectional.	Barebacker identity.	Sexual behaviours, sexually related substance use, and drug/alcohol influenced sexual expectancies.	Sexual compulsivity and romantic obsession.	Barebackers reported more drug use and higher peer norms for unprotected sex. Barebackers were also higher in drug and alcohol related sexual expectancies.	64% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Caldwell et al., 2004) US	To examine racial identity and parental support as predictors of alcohol use.	African American adolescents (N = 488; M age = 17.49 years; SD = .63).	Quantitative; cross-sectional.	Racial identity.	Alcohol use.	Parental support.	Private regard was associated with less alcohol use for adolescents who reported that race was a more central part of their identity.	69% (Moderate)
(Pugh & Bry, 2007) US	To examine the extent to which individual differences in alcohol and marijuana use among Black university students can be accounted for by degree of ethnic identity.	Black young adults (N = 167) aged 18 to 23 years (M = 19.75; SD = 1.37).	Quantitative; cross-sectional.	Ethnic identity.	Alcohol and marijuana use.	Friends' alcohol and marijuana use.	Higher levels of ethnic identity were related to lower alcohol and marijuana use.	74% (Moderate)
(Holley et al., 2006) US	To explore whether youth's ethnic identity is related to norms about and use of cigarettes, alcohol, and marijuana.	Seventh and eighth graders of White or Mexican descent and other ethnic minorities (Sample 1 N = 346; Sample 2 N = 301; Sample 3 N = 61).	Quantitative; longitudinal.	Ethnic identity.	Actual lifetime and recent substance use, and future intentions to use substances.	Injunctive, descriptive, and personal norms regarding substance use.	A stronger sense of ethnic identity predicted anti-drug norms and less use of alcohol, cigarettes, and marijuana.	69% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Grossbard et al., 2009) US	To evaluate the influence of college student and college athlete descriptive norms and levels of athletic identity on drinking and related consequences.	Freshmen (N = 1119; M age = 17.97 years; SD = 1.66).	Quantitative; cross-sectional.	Athletic identity.	Alcohol consumption	Drinking norms and alcohol-related consequences.	Athletic identity moderated associations among gender, perceived norms, drinking, and related consequences. Athlete-specific norms had a stronger effect on drinking among those reporting higher levels of athletic identity, and higher levels of athletic identity exclusively protected males from experiencing drinking-related consequences.	74% (Moderate)
(Zhou et al., 2015) UK	To examine the differences in alcohol consumption and psychosocial antecedents between team and individual sportspeople.	University sportspeople (N = 1785) aged 17 to 37 years (M = 20.07; SD = 2.68).	Quantitative; cross-sectional.	Athlete identity.	Alcohol consumption.	Subjective happiness.	Athlete identity predicted alcohol consumption. Team sports players reported greater alcohol consumption and higher athlete identity. For individual sport players, as athlete identity increased alcohol consumption reduced; however, there was a positive association between identity and consumption for team sport players.	64% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Zhou et al., 2014) UK	To explore the relationship between social cohesion, identity, self-reported happiness, and student sportspeople's drinking.	University sportspeople (N = 243; M age = 20.56 years; SD = 1.84).	Quantitative; cross-sectional.	Sporting identity.	Alcohol consumption and drinking for team cohesion.	Social cohesion and subjective happiness.	Age, happiness, and team cohesion, but not sporting identity, predicted alcohol consumption. The relationship between happiness and alcohol consumption was mediated by team cohesion.	64% (Moderate)
(James et al., 2000) US	To examine how ethnic identity is related to drug use patterns in racial/ethnic minority adolescents.	Ethnic (Asian Americans, African Americans, Native Americans, Hispanics, and Mixed) and White adolescents (N = 127) aged 11 to 20 years (M = 16.5).	Quantitative; cross-sectional.	Ethnic identity.	Drug use.		A high level of cultural identity was associated with heavy drug use in the ethnic minority sample.	49% (Low)
(Fuqua et al., 2012) US	To examine associations between peer group identification and smoking.	Seventh grade students (N = 2698) aged 10 to 15 years.	Quantitative; cross-sectional.	Group identity.	Tobacco use.		As students endorsed more high-risk groups, the greater their risk of tobacco use. Gangsters/Cholos, Paisanos, Rockers, or Skaters/Bladers were at the greatest risk of tobacco use.	71% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Guendelman et al., 2011) US	To examine whether threat to American identity can cause Asian Americans to change their food preferences and food choices.	Study 2: Asian Americans (N = 51; M age = 19.4 years).	Quantitative; experimental.		Food choice.	Negative emotions.	Asian Americans ordered and ate dishes that were more American and unhealthy when their American identity was threatened than when their American identity was not threatened.	62% (Moderate)
(Schofield et al., 2001) Australia	To investigate whether smoking is a stereotypical attribute of particular social groups and how group normative influence with regard to smoking may affect group members' personal smoking involvement.	Young adults (wave 2 N = 2316; wave 3 N = 1927; wave 4 N = 1783).	Quantitative; longitudinal.	Group identity.	Smoking involvement of the individual and peer group norm.	Peer group descriptor and peer group change.	Smoking status was related to a favourable peer group smoking norm – particularly amongst high identifiers. Individuals whose behaviour was discordant with the group norm reported lower group identification, over time, changed their friendship group to one with norms more compatible with their own behaviour.	73% (Moderate)



Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Barber et al., 2001) US	To examine the long-term risk and adjustment patterns associated with activity and identity choices in adolescence.	Young adults (N = approximately 900).	Quantitative; longitudinal.	Social identity group (jock identity, princess, brain, basket case, and criminal).	Alcohol consumption and drug use.	Activity involvement, academic outcomes, job characteristics, psychological adjustment, academic aptitude, and family demographics.	Group identity predicted later substance use. Jocks and criminals drank most often and brains and basket cases least often. Criminals used marijuana most often and brains least often.	64% (Moderate)
(Miller et al., 2005) US	To examine relationships between “jock” identity and adolescent sexual risk-taking.	Adolescents (N = 598 at wave 2; Mean age = 16.6 years).	Quantitative; longitudinal.	Jock identity.	Sexual risk-taking.	Family socioeconomic status, family cohesion, dating frequency, and involvement in sports.	Jock identity was associated with higher levels of sexual risk-taking.	71% (Moderate)
(Miller et al., 2003) US	To explore the relationship between identification with the “jock” label and adolescent alcohol consumption.	Adolescents (N = 699) aged 14 to 19 years (at wave 3).	Quantitative; longitudinal.	Jock identity.	Alcohol consumption.	Physical maturity, social maturity, and involvement in a supervised athletic network.	Jocks were more likely to engage in problem drinking than non-jocks.	62% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Oyserman et al., 2007) US	To examine how the social identities of ethnic minority and majority participants influence their beliefs about ingroup goals and strategies.	Undergraduate students (N = 395), eight grade students (N = 102), and American Indian adults (N = 109).	Quantitative; experimental.	Social identity.	Healthy and unhealthy behaviour.	Health fatalism, health knowledge, utility of health promotion,	Minority participants viewed healthy behaviour as outgroup behaviour and unhealthy behaviours as part of their ingroup identity and displayed less desire and intent to engage in a healthy lifestyle and expressed more fatalism about their health. This negative relationship was heightened when the salience of their social identity was strengthened through priming.	74% (Moderate)
(Flores et al., 2009) US	To explore the relationship between gay identity related factors and unprotected anal sex among men who have sex with men.	Men who have sex with men (N = 483) aged 18 to 68 years (M = 34; SD = 9.7).	Quantitative; cross-sectional.	Gay identity (gay community involvement, gay bar/club attendance, gay identity importance, and self-homophobia).	Sexual risk behaviour.	Gay community involvement, gay bar/club attendance, self-homophobia, HIV status, and frequency of alcohol use	Gay identity importance was not associated with sexual risk behaviour but gay community involvement and gay club/bar attendance was.	67% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Rinker & Neighbors, 2014) US	To examine whether different dimensions of social identity moderate the association between perceived descriptive norms and drinking.	College students (N = 1095) aged 18 to 26 years (M = 21; SD = 1.85).	Quantitative; cross-sectional.	Four dimensions of social identity (affiliation with other students): importance, commitment, superiority, and deference.	Drinks per week and perceived descriptive norms.		Norms were associated with drinking and this association was stronger among those who viewed the university's student body as part of their own identity and were more committed to their fellow students.	64% (Moderate)
(Dumas et al., 2018) US	To examine the indirect relationship between drinking group descriptive norms and individual drinking consequences via individual descriptive norms.	Study 1: adults (N = 280) aged 18 to 29 years (M = 26.30; SD = 2.73).  Study 2: Adults (N = 340) aged 18 to 29 years (M = 25.45; SD = 2.83).	Quantitative, cross-sectional.	Drinking group identification (GI) and identification with emerging adulthood (EA).	Heavy episodic drinking (HED) and drinking consequences.	Within-group status.	Higher status was associated with more individual HED and drinking consequences. GI and EA strengthened the relation between group and individual HED. The indirect relation between group HED and individual drinking consequences was stronger for individuals who identified more with their drinking groups and with EA.	60% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Banwell & Young, 1993) Australia	To examine the role smoking plays in the presentation of social identity.	Young women (N = 83) aged 13 to 18 years.	Qualitative, focus groups.	Social identity.	Smoking.		Young women may smoke to construct a social identity (i.e., adult identity). They may also perceive anti-smoking messages as attempting to deny their right to express their chosen social identity.	38% (Low)
(Neighbors et al., 2013) US	To examine social influences and marijuana use, and how heavy marijuana users view themselves relative to their peers.	Heavy marijuana users (N = 107).	Quantitative, cross-sectional.	Identification with typical students and other marijuana-using students.	Perceived norms for marijuana use and marijuana use.		Identification with other marijuana users was associated with more use. Perceived norms were associated with more use but primarily among those who identified more with other users.	48% (Low)
(L. F. Campbell & Stewart, 1992) US	To examine perception of risk for AIDS as a function of membership in an identified risk group from the perspective of social identity theory.	College students, IV drug-users, and homosexual individuals (N = 126).	Quantitative; cross-sectional.		Risk behaviours, group risk behaviours, and perceived AIDS risk associated with risk behaviours		The risks for ingroup behaviours compared to outgroup behaviors were underestimated, particularly in the IV drug-user and homosexual groups.	64% (Moderate)

Citation and Country	Objective	Sample	Method	Identity Variable	Health Risk Variable	Other Examined Variables	Key Findings	Quality Appraisal
(Loersch & Bartholow, 2011) US	To investigate whether cues related to ingroup membership would change perceptions of the safety of alcohol.	Study 1: Undergraduate students (N = 98).  Study 2: Undergraduate students (N = 67).  Study 3: Undergraduate students (N = 77).	Quantitative; experimental.		Perceived risk of drinking beer.	Beer exposure,	Participants viewed ingroup associated beer cans as less risky to drink.	48% (Low)

## Appendix M: Information Sheet (Study 5)



# INFORMATION SHEET

**Study Title:** *Shared Social Identity in Mass Gatherings and Health: Perspectives from Healthcare Professionals*

### **Invitation**

You are being invited to consider taking part in the research study *Shared Social Identity in Mass Gatherings and Health: Perspectives from Healthcare Professionals*. This project is being undertaken by Daniella Hult Khazaie, a PhD candidate at the School of Psychology of Keele University (United Kingdom) and is being supervised by Dr Sammyh Khan and Prof Clifford Stott.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully. Ask us if there is anything that is unclear or if you would like more information.

### **Aims of the Research**

The research aims to elucidate how social identity processes are implicated in health risks in mass gatherings and how these can be drawn upon in the design of health communication materials to mitigate the risks.

### **Why have I been invited?**

You have been invited as you fulfil the study criteria: You are 18 years of age or older and a qualified healthcare professional who has provided healthcare within a mass gathering setting.

### **Do I have to take part?**

You are free to decide whether you wish to take part or not. If you do decide to take part you will be asked to provide your informed consent. You are free to withdraw from this study at any time and without giving a reason. However, you will no longer be able to withdraw your data once one month has passed since your participation in the study.

### **What will happen if I take part?**

After reading this information sheet you will be asked to provide your informed consent to take part in this study, if you are still happy to participate. The audio-recorded interview will then begin once you have indicated that you are ready. You will be asked questions primarily pertaining to your experiences of providing healthcare at mass gathering events and you will be asked to reflect on how you think social identity processes may be implicated in health risks at mass gathering events. You will also be asked to reflect on how you think social identity processes can be used to mitigate health risks in mass gatherings. Finally, after the interview has ended, you will be asked to fill out a brief questionnaire inquiring about your beliefs concerning the importance of social identity processes in mass gathering-associated health risks. This study typically takes no longer than 45 minutes to complete.

### **What are the benefits (if any) of taking part?**

There may not be any direct benefits to you of taking part. However, findings will further our understanding of the role of social identity in processes in aggravating and mitigating health risks in mass gatherings.

### **What are the risks (if any) of taking part?**

There are no foreseeable risks of taking part in this study.

### **How will information about me be used?**

Participation is anonymous and confidential. All identifying information (e.g., names, locations, and dates) you provide in the interview will be rendered anonymous through the use of pseudonyms or fictitious information. Your responses to the questionnaire will be pooled with other participants' data and used for analysis. In accordance with American Psychological Association guidelines, the overall (anonymised) findings may be submitted for publication in a scientific journal or presented at academic

conferences. Additionally, the overall findings will be included in a PhD thesis and anonymous data may be shared via Open Science.

**Who will have access to information about me?**

All collected data will be rendered anonymous, pooled, and presented in aggregate form only – therefore no participants will be identifiable. Only the researcher and supervisors of the research will have access to the raw data. In compliance with the Keele research data management policy, the data will be kept for a minimum of 10 years following project completion.

**Who is funding and organising the research?**

This research project is funded by Keele University and is being organised by Daniella Hult Khazaie who has received a PhD scholarship from the university.

**What if there is a problem?**

If you have a question or concern about any aspect of this research, you may wish, in the first instance, to contact the lead researcher, Daniella Hult Khazaie ([a.k.d.hult.khazaie@keele.ac.uk](mailto:a.k.d.hult.khazaie@keele.ac.uk)). If they cannot address your concerns or you wish to make a complaint, please contact the Chair of the Psychology Research Ethics Committee at [psychology.ethics@keele.ac.uk](mailto:psychology.ethics@keele.ac.uk) or Keele University Research Governance at [research.governance@keele.ac.uk](mailto:research.governance@keele.ac.uk).

**Contact for further information**

Daniella Hult Khazaie  
[a.k.d.hult.khazaie@keele.ac.uk](mailto:a.k.d.hult.khazaie@keele.ac.uk)



## Appendix N: Consent Form (Study 5)



### CONSENT FORM

**Title of Project:** *Shared Social Identity in Mass Gatherings and Health: Perspectives from Healthcare Professionals*

**Name and contact details of researcher:** Daniella Hult Khazaie, Keele University, School of Psychology, [a.k.d.hult.khazaie@keele.ac.uk](mailto:a.k.d.hult.khazaie@keele.ac.uk)

**Please initial box if you agree with the statement.**

1. I confirm that I have read and understood the information sheet for the above study.
2. I understand that my participation is voluntary and that I am free to withdraw at any time by contacting researcher through the details provided in this consent form and the information sheet. I am aware that withdrawal will result in permanent deletion of the data; however, once one month has passed since my participation in the study, I will no longer be able to withdraw my data from the study.
3. I allow my anonymised data to be used for publications, conferences, and future research projects.
4. I agree to take part in this study.

\_\_\_\_\_  
Name of participant                      Date                      Signature

\_\_\_\_\_  
Name of Researcher                      Date                      Signature

If you wish to be informed of the study results once publicly available, please provide your email address below:

\_\_\_\_\_

## Appendix O: Ethical Approval Letter (Study 5)



Keele University FNS Psychology Faculty Research Ethics Committee  
[psychology.ethics@keele.ac.uk](mailto:psychology.ethics@keele.ac.uk)

25.07.19

Dear Daniella,

<b>Project Title:</b>	Shared Social Identity in Mass Gatherings and Health: Perspectives from Healthcare Professionals
<b>REC Project Reference:</b>	PS-190057
<b>Type of Application</b>	Amendment

Keele University's Psychology Research Ethics Committee (PSY-FREC) reviewed the above amendment.

### **Favourable Ethical opinion**

The members of the Committee gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Yours sincerely,

**Joseph Brooks**  
Chair / Lead Reviewer

## Appendix P: Participant Characteristics (Study 5)

*A Summary of Participant Characteristics, Including Line of Work and Experiences of Providing Healthcare in a Mass Gathering Setting*

Participant key	Gender	Qualification	~Years qualified	~Years MG-experience*	N events**	Team
P1	Female	Nurse	28	4	1	LP
P2	Female	Nurse	12	1	1	LP
P3	Female	Nurse	16	1	1	LP
P4	Female	Nurse	33	1	1	LP
P5	Female	Nurse	28	7	1	LP
P6	Female	Nurse	N/A	11	>6	EMP
P7	Male	Paramedic	39	35	>7	EMP
P8	Female	Nurse	43	5	>6	EMP
P9	Female	Podiatrist	N/A	12	>2	EMP
P10	Male	FREC3	1	1	2	EMP
P11	Male	Doctor	25	8	>6	EMP
P12	Male	FREC4	10	10	4	EMP
P13	Male	FREC3	2	2	2	EMP
P14	Female	Nurse	42	10	>3	EMP
P15	Female	Nurse	10	9	>1	EMP
P16	Male	Nurse	7	2	1	EMP
P17	Female	Nurse	40	2	2	EMP

*Note:* \*Approximate no. years providing healthcare within a mass gathering setting; \*\*Approximate no. of different types of events healthcare has been delivered at; N/A = information has not been provided by participant; FREC3 or 4 = First Response Emergency Care, level 3 or 4; LP = Lourdes pilgrimage; EMP = Event medical provider (music festivals).

## Appendix Q: Interview Schedule (Study 5)

### Interview Schedule

1. Can you tell me a bit about yourself?
2. How long have you been working as [job role]?
3. Have you provided healthcare at [mass gathering event]?
4. Why did you choose to provide healthcare at [mass gathering event]?
5. Could you tell me a bit about what it is like to provide healthcare at [mass gathering event]?
6. How does providing healthcare at [mass gathering event] differ from your normal work arrangements?
7. What difficulties/challenges do you face when you provide healthcare at [mass gathering event]?
8. What are the most common injuries/illnesses you treat at [mass gathering event]?
9. Are there any health risks associated with the [mass gathering event]?
10. What behaviour(s) do [event attendees] engage in that could put their health at risk?

*I would just like to remind you that we experience shared social identity when we perceive others to belong to the same social group as us. For example, “we pilgrims/festival-goers/we women/we Christians”. Research has shown how this leads to more intimate relations with group members, for example higher levels of cooperation, social support and trust, but it can also increase engagement in health-impairing behaviour.*

*With this in mind...*

11. ...would you say there is a sense of shared social identity amongst [event attendees] at [mass gathering]?
12. Do [event attendees] act in a special way toward one another than they normally would in an everyday situation?
13. Do you think experiencing a sense of shared social identity could affect [event attendees'] health-related behaviours?
14. Do you think social identity can be used in the design of health communication materials and interventions to mitigate health risks?
15. What could be an effective way to discourage health risk behaviour brought about by sharing a social identity, without disrupting the [mass gathering event]?
16. Have you provided healthcare at other mass gathering events?
17. How do you think shared social identity, and its effect on health behaviours, may differ between [mass gathering event] and other more [secular/religious] mass gatherings?