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A systematic review and meta-analysis of procedural justice and legitimacy in policing: the effect of social identity and social contexts

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Abstract

Objectives To systematically review the effect of social identity and social contexts on the association between procedural justice and legitimacy in policing.

Methods A meta-analysis synthesising data from 123 studies ($N = 200{,}966$) addressing the relationship between procedural justice and legitimacy in policing. Random effects univariate and two-stage structural equation modelling meta-analyses were performed.

Results Both procedural justice and social identity are found to be significantly correlated with police legitimacy. Moreover, social identity significantly mediates, but does not moderate, the association between procedural justice and legitimacy. People of younger age and from more developed countries tend to correlate procedural justice stronger with police legitimacy.

Conclusion This study demonstrates that social identity is an important antecedent of legitimacy and a critical factor in the dynamics of procedural fairness in policing. It also shows that the extent to which procedural justice and legitimacy are correlated varies across social groups and contexts. The theoretical implications of our findings are discussed.

Keywords Group engagement model · Group value model · Legitimacy · Policing · Procedural justice · Social identity · Uncertainty management model

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Introduction

Procedural justice theory (PJT) has become a dominant paradigm in contemporary police research. Among other things, compared to the classic crime control model of deterrence, enhancing legitimacy via procedural justice is argued to be more cost-effective and sustainable in terms of encouraging law-abiding behaviours, as it relies on an internalised sense of obligation among those being policed (Tyler, 1990). The theory proposes that individuals are more likely to perceive authorities as legitimate and trustworthy when they feel they are treated in a fair and respectful manner by those authorities. Normative compliance is thus promoted by procedurally fair policing, as the public tends to be more cooperative and compliant with laws when they have strong legitimacy beliefs (Tyler, 2001).

Another central argument in PJT is that procedurally fair actions by authorities send important identity-related signals to citizens and communicate shared values and norms (Bradford, 2016; Schaap & Saarikkomäki, 2022; Sunshine & Tyler, 2003a; Tyler & Blader, 2003). A sense of shared values and social similarity, in turn, promotes legitimacy. An understanding of the psychology of social identity is therefore vital if we are to properly elucidate the relationship between perceptions and experiences of procedural (in)justice and police legitimacy (Bradford, 2014; Bradford et al., 2015; Murphy et al., 2022). Yet, despite a recently increasing body of procedural justice research focussing on social identity, within policing contexts at least, the role of social identity processes in procedural justice theory remains under-specified. To address this lacuna, and properly position social identity within theories of police legitimacy, this review tests three social identity-based models of procedural justice, and three constructs of social identity (which are described below), as well as the role of contextual factors in how individuals relate procedural justice and legitimacy in the context of policing.

Procedural justice theory in policing

PJT is premised on a collection of empirical and theoretical studies focussing on understanding how process fairness shapes perceptions of authorities. While its origins can be traced back to early work by Thibaut and Walker (1975) on procedural justice effects in the perceived fairness of decision-making in criminal trials, PJT has since been studied in a wide variety of social contexts (Blader & Tyler, 2015; Trinkner & Cohn, 2014), such as workplace (e.g. Feldman & Tyler, 2012; Hegtvedt et al., 2022), family (e.g. Brubacher et al., 2009; Thomas et al., 2018), and school (e.g. Brasof & Peterson, 2018). While research on procedural justice and legitimacy in work organisations and court procedures has received strong support, these ideas have perhaps particularly been applied to policing (Tyler, 2017).

In criminal justice research, procedural justice is the perception that legal institutions, such as the police and courts, are fair and just during the process of law

enforcement (Tyler, 1990). Advocacy for a procedural justice approach in the criminal justice system has been strongly influenced by Tyler's (1990) seminal work on procedural justice and public compliance. Building upon his own work, Tyler developed a model of process-based regulation which illustrated the psychological path from procedural justice perceptions to long-term acceptance of and cooperation with authorities (Tyler, 2003). The model suggests that the quality of decision-making and interpersonal treatment which the public experiences in their encounters with authorities are the two key antecedents of their assessments of processes and procedures (Tyler & Blader, 2000). Assessments of the quality of decision-making focus upon authorities' neutrality and lack of bias in making their judgements and decisions during encounters with those they govern. People prioritise the idea that authorities should rely on objective information and not personal biases and prejudices. Moreover, when authorities make decisions based consistently on rules and regulations and provide opportunities for people to present their evidence and explanation, the process of decision-making is more likely to be perceived as being fair. Assessments of the quality of treatment address 'interactional' experiences of the public in their encounters with authorities. It is proposed that people want to be treated with respect and dignity, as this signals the authorities' recognition of their status and value in their social group (Tyler, 2003).

While this model can, as noted, be applied to many social and institutional relationships marked by power imbalances, our focus here is on police-citizen relations. According to PJT, during police encounters, people tend to believe that officers should explain and justify their actions and treat people with respect and dignity. A large empirical literature suggests that when people perceive a good quality of decision-making and interpersonal treatment in their encounters with the police, they are more likely to perceive them as legitimate and are thus more willing to cooperate and comply with their directives (Sunshine & Tyler, 2003a). Although this process-based regulation model maps out how police procedural fairness can ultimately lead to cooperative behavioural outcomes, our interest in this paper is the link between procedural justice perceptions and legitimacy judgements.

In a recent review on the state of legitimacy scholarship, Hamm et al. (2022) proposed a concentric diagram to capture the five fundamental theoretical propositions of legitimacy from the existing literature. At the core of the diagram is the 'dialogue of legitimacy', proposed by Bottoms and Tankebe (2012), in which legitimacy is positioned 'as always dialogic and relational in character' (p.129). On this account, police legitimacy is not a given but is something that emerges from active ongoing interactional processes through which the police, as power holders, make claims on their right to power, and those claims are responded to by the policed, usually as subordinates within that relationship (Jackson & Bradford, 2022). Hamm and colleagues' proposition is premised on a specific reading of the account of legitimacy offered by procedural justice theory, which stresses the interactional and relational dynamics between police and people that underpin legitimacy. In other words, each interaction between the police and the public takes place within a negotiated power relationship that can either be accepted or resisted by citizens.

Within the procedural justice literature, there is a broad consensus that legitimacy, from the perspective of those subject to police power, is 'a psychological property of authorities which leads those governed by them to perceive their power as acceptable and justified' (Hamm et al., 2022; Martin & Bradford, 2021; Tyler, 2006). While this conceptualisation of legitimacy relies on an empirical account drawn primarily from social psychology and is heavily influenced by Easton's (1965) approach to 'diffuse' support (Tyler, 1990), contemporary policing research also takes advantage of the normative approaches adopted by political philosophers in conceptualising legitimacy. Following Tankebe's (2008) approach to Beetham's (1991) three-component model in the study of police legitimacy, Jackson and Bradford (2010) specified three criteria to determine police legitimacy: obligation to obey, normative alignment, and legality.

'Obligation to obey' concerns the expressed consent from the public—whether people feel a moral duty to follow police officers' instructions *even if* they disagree with their content and/or those decisions go against their self-interest. 'Normative alignment' assesses the moral foundations of policing by measuring the degree to which people feel that they share similar moral values and judgements with the police (in other studies, trust and confidence in the police are held to imply broadly the same sense of value alignment). Lastly, 'legality' concerns people's perceptions of police behaviours—do they believe that police actions are legally valid and justifiable? However, it has been suggested that perceived lawfulness, or legality, cannot capture individuals' experiences in everyday experiences of the police as people rarely rely on the law when they evaluate police behaviour (Meares et al., 2015; Worden & McLean, 2018). Perhaps as a result, in recent policing studies, police legitimacy has generally been conceptualised and measured as either (a) obligation to obey the police and the normative alignment with the police (e.g. Bradford, et al., 2017a, b; Huq et al., 2017; Kyprianides et al., 2022; Trinkner et al., 2018) or (b) as general trust and confidence in the police, sometimes with or/and sometimes without obligation to obey (e.g. Li, 2018; Murphy, 2013; Wolfe & McLean, 2021).

Psychological underpinnings of procedural justice theory

Within the procedural justice literature, there has long been a concern with the question of why and when are people willing to accept decisions made by authorities when those decisions cut against their objective and subjective self-interest. Early political science accounts such as social exchange theory suggested that individuals are self-interested, rational, and calculated in exchanging their resources in order to maximise their chances of survival and success in social systems (Cropanzano & Mitchell, 2005). Within this theoretical climate, Thibaut and Walker (1975, 1978) explored how perceived procedural justice in criminal proceedings could enhance disputants' willingness to accept decisions made by the authorities even when those decisions were not favourable to them. Based on the self-interest account, Thibaut and Walker's (1975) control model of procedural justice argues that people care about procedural justice because they desire fair—and thus potentially favourable—outcomes. Given an embedded power relationship with the authority, disputants

seek the opportunity to have their 'voice' in the criminal justice procedures so as to maximise the likelihood of reaching a fair outcome by allowing the authority to make decisions based on the evidence presented by different parties. This implies that procedural justice matters to people because it provides them with indirect control over their outcomes, where greater control indicates a greater chance of achieving the subjectively 'right' outcome.

Noting that the self-interest model has shortcomings in terms of explaining the apparent importance in fairness judgements of non-instrumental procedural factors such as polite and dignified treatment, Lind and Tyler (1988) proposed the Group Value Model (GVM), one of the earliest attempts articulating the relational value of procedural justice. Based on the group identification process, the GVM argues that people care about how authorities treat them because this provides information about their relationship with the authority. With the assumption, widely shared with early theories of social identification, that group membership is an important source of self-esteem and identity for individuals (Tajfel & Turner, 1979), on this account, procedural justice matters because people desire to be included and accepted by social groups that they perceive to be important.

In PJT, the police are often positioned as 'proto-typical group representatives' (Sunshine & Tyler, 2003b), who generally symbolise nations or communities (Bradford et al., 2014a), such that police officers and citizens are conceptualised as authorities and subordinates within a shared social group. With the assumption that individuals tend to value feedback from in-group authorities more than out-group authorities (Smith et al., 1998), the GVM proposes that police procedural justice matters more to those with stronger identification with the social group or the group of/represented by the police. According to this model, social identity is thus a *positive moderator* of the effect of procedural justice perception on legitimacy.

Subsequent to the GVM, Tyler and colleagues developed the Group Engagement Model (GEM). With an acknowledgment on the cognitive and evaluative components of social identity (Blader & Tyler, 2009), the GEM proposes that the positive identity-relevant information conveyed by procedural justice has the capability to shape the individuals' social identification with the group embodied and/or represented by the police (Tyler & Blader, 2003). Strengthened social identification with the group then, in turn, encourages positive legitimacy judgements, since people are motivated to support the authorities of groups marked by appropriate—just—social relationships (Bradford et al., 2017a, b; Turner & Reynolds, 2010). Accordingly, since social identity thus serves as a *mediator* to 'explain' the effect of procedural justice on legitimacy, the GEM is also referred to as the 'social identity mediation hypothesis' by Tyler and Blader (2003).

A third and relatively less discussed model of procedural justice is the Uncertainty Management Model (UMM) proposed by van den Bos and Lind (2002). Although the UMM also addresses the value of procedural justice based on the social identification process, it argues for a different motivational underpinning of the process based on the subjective uncertainty reduction model of motivation (Hogg, 2001). Under this model, the social identification process is driven by people's need to reduce their sense of uncertainty—they want to affirm a social identity to resolve their sense of uncertainty in contexts that are new, unfamiliar, or

unsettling. Those who feel uneasy about their relationship with authorities, or in other words have a weak identification with the authority, and/or who are uncertain about what to expect from authorities, want more information about the authority's trustworthiness before they decide how to react to an outcome that they received from the authority (van den Bos & Lind, 2002). While positive identification with the authority can provide such reassurance, it is hypothesised that procedural justice matters more to those who are less certain about their relationship with the police (i.e. having weaker social identification with the police). Social identity is a *negative moderator* of the association between procedural justice and legitimacy on this account. Such negative moderation hypothesis is also shared by the perspective of system justification theory, in which individuals from the minority or low-status group are inclined to accept the status quo (including seeing system and the police legitimate) due to their need for order and stability (Blount-Hill, 2019).

These three social identity-based models have different claims on the effect of social identity on how procedural justice correlates to legitimacy. Our first objective is to review evidence from existing studies to assess how well these models are supported empirically. With the increasing numbers of studies looking into social identity in their articulation of procedural justice and legitimacy, it is necessary to evaluate these models when we advance the theorization of the social identification process in PJT.

Social identity thus plays a vital role in explaining why procedural justice matters. Arguably, though, the concept of social identity current in the (policing) PJT literature is out of kilter with current thinking within the field of social psychology, where social identity theory (SIT) (Tajfel & Turner, 1979) and self-categorisation theory (SCT) (Turner et al., 1987)—the 'social identity approach' (Reicher et al., 2010)—constitute highly influential theories of group processes and intergroup relations. Social identity theorists seek to understand and explain how intergroup dynamics and social identification processes influence individual's perception, attitudes, and behaviours across various social contexts (Hornsey, 2008). Putting this into the context of policing, Reicher (1984, 1987, 1996) and other contemporary crowd psychologists have sought to understand how social identity plays a role in transforming participants' cognition, relation, and emotion in crowd events such as protests and riots (Drury & Reicher, 2020). When category distinctions are salient, individuals tend to shift from their personal identity to the 'social identity', which derives from the social categories that they belong to, enabling them to see and think the social world through the lens of the group (Stott & Radburn, 2020). As a result, group values and norms come to serve as the basis for the cognition and behaviour of members, including their perception of police legitimacy (Stott et al., 2017). Most relevant for current purposes, the social identity approach problematises the idea that police represent an over-arching or dominant identity category towards which people simply orient themselves. Instead, 'the police' are positioned as one of many categories that may be relevant to people within a particular context, and it is the extent to which people identify with *the police* that is important in transforming perceptions of procedural justice into legitimacy. This account has started to gain traction in PJT research and is included in the current review.

Operationalization of social identity in studies of procedural justice and legitimacy

There are three primary ways in which social identity is conceptualised and operationalised (or the kinds of social groups measured) in existing policing studies, each of which subtly shifts the underlying model. The most common and traditional approach derives from the perspective of the GEM, that the police are regarded as a 'proto-typical group representative' (Sunshine & Tyler, 2003b) or a symbol representing nations, communities, or neighbourhoods (Bradford et al., 2014b). Based on this assumption, social identity is operationalised as an individuals' level of identification with a superordinate group (a higher-level social group that includes lower-level social groups as subgroups) represented by the police, which is commonly taken as one's nations and communities, as well as the notion of the 'law-abiding citizens' (e.g. Murphy & Cherney, 2018; Tyler & Jackson, 2014). This approach heavily relies on the assumption that police officers are seen to act as pre-defined 'moral arbiters'. Since the prototypicality of police in representing the moral values of a nation or community is generally assumed without testing in most studies, this could be problematic when it is applied to situations where people *do not* see police as representative of these superordinate categories. For example, police might be perceived by protestors as hostile outsiders who attack their community rather than being prototypical representatives of it (Radburn & Stott, 2019).

Building upon empirical findings from studies on policing crowd events (e.g. Stott et al., 2008), a different approach is to measure social identity via relational identification with the police (e.g. Kyprianides et al., 2021; Radburn et al., 2018). Here, the assumption is that police do not simply represent a superordinate social category, but they are seen as a distinct and possibly separate group by those being policed. From the perspective of those engaging with police, identification with the police can be activated and enhanced by the experience of procedural justice; or it can be damaged or undermined by the experience of procedure injustice. Relational identification is thus measuring the extent to which police are positioned as an in- or out-group, based on the judgement of their behaviours. Given that measuring relational identification with the police is argued to be more context specific, and that superordinate categories may be less salient to individuals during encounters with police, there have been moves towards adopting relational identification measures in recent procedural justice studies (Kyprianides et al., 2022; Murphy, 2023; Radburn et al., 2018).

Dichotomous social categorisation is a third approach to conceptualising social identity. Rather than measuring identification with assumed shared social categories or the social group of police with a continuous scale, a small number of studies (e.g. Blount-Hill, 2020; Saulnier & Sivasubramaniam, 2021) consider respondents' perceptions of their relationship with the police in terms of whether police are perceived as the in-group authority or a (dominant) outgroup. Given that social identity is a complex and fluid concept to be studied, some rarer approaches to social identity are recognised but cannot be included in this review.

The second objective of our review is to evaluate these different approaches to measuring social identity in PJT research. In particular, we consider which if any is the stronger predictor of police legitimacy.

The effect of procedural justice on legitimacy: the (in)variance claim

Much existing research has considered the impact of contextual factors aside from social identity on the relationship between procedural justice and legitimacy in policing. Thus far, it is not clear whether the relationship between procedural justice and legitimacy is consistent or 'invariant' (Wolfe et al., 2016). While some studies suggest that age, gender, and ethnicity may moderate the procedural justice to legitimacy pathway (Fine et al., 2020; Kahn & Martin, 2016; Sargeant et al., 2014; Sun & Wu, 2022; Tyler & Huo, 2002), others indicate that this association does not vary across demographic categories such as ethnicity, gender, education, age, income, or ideology (Huo, 2003; Tyler, 1994, 2000, 2004; Wolfe et al., 2016). In order to address this 'invariance thesis', the last objective of this review is to test the effects of contextual factors on the correlation between procedural justice and legitimacy.

We consider here whether the socio-demographic characteristics of research subjects—age, gender, and ethnicity—moderate the association between procedural justice and legitimacy. We also explore the potential impact of social context, focussing on two aspects of the wider societal context within which police-public relationships are formed. Given that the majority of PJT studies have been conducted in Western democracies, the generalizability of PJT across cultures and societies is underexplored. For instance, the effect of procedural justice was tested in South Africa and Ghana by Bradford et al., (2014a) and Tankebe (2008), respectively, to address its applicability in 'less cohesive' and post-colonial societies. Both concluded that procedural justice could be less influential in these countries than judgements about other aspects of police behaviour, such as effectiveness. Procedural justice could be outweighed by security concerns in less developed countries. Moreover, since procedural justice is a critical element in models of democratic policing (Muntingh et al., 2021) and procedural justice perceptions are thought to be influenced by legal socialisation (Trinkner & Tyler, 2016), people from countries with different levels of democracy might have different 'baseline' or underlying perceptions of police procedural justice and legitimacy (and indeed of the relationship between the two).

Systematic review on procedural justice policing

Previous systematic reviews of procedural justice-based policing have demonstrated that procedural justice can enhance police legitimacy (Mazerolle et al., 2013), encourage law compliance (Walters & Bolger, 2019), and promote collective efficacy (Yesberg et al., 2023). Our study builds upon and extends this prior work in a number of ways. First, given the extent of research activity in this area, there is a need to update earlier findings. While our study is certainly similar to

the systematic review done by Walters and Bolger (2019), we add evidence from at least 54 samples published since their review (we also limit our attention only to policing, rather than the wider criminal justice system, on the basis that this enables more focussed consideration). Second, and more importantly, previous review studies have not considered why procedural justice links to legitimacy, nor provided a systematic review addressing the role of social identity in PJT. Third, there has been no systematic review exploring the invariance thesis (although see Sun and Wu 2022).

The purpose of this study is thus three-fold. First, we consider which if any of the three social identity models outlined above (GVM, GEM, and UMM) are best placed to explain the link between procedural justice and legitimacy. An iterative set of hypotheses guide this effort. As an initial matter, given that the links between procedural justice and legitimacy, and between social identity and legitimacy, are well established in the literature, we hypothesise that procedural justice positively correlates with legitimacy (H_1) and that social identity positively correlates with legitimacy (H_2).

It is important to recognise, though, that procedural justice perceptions and social identification can shape legitimacy judgements independently. On one hand, procedural justice does not only carry identity-relevant information, but it also carries instrumental value, as suggested by Thibaut and Walker's (1975) control model, and can affect one's emotionality during the encounter (Brown et al., 2022). On the other hand, social identity can encourage group-related attitudes without the presence of procedural justice. Other factors in police encounters, such as bounded authority (Trinkner et al., 2018) and community contacts (St. Louis & Greene, 2020), can also convey identity-relevant signals to those being policed. Thus, it is hypothesised that procedural justice will predict legitimacy while controlling for social identity (H_3) and that social identity will predict legitimacy while controlling for procedural justice (H_4). Finally, to address the salience of the different social identity models, we hypothesise that the interaction between procedural justice and social identity has a significant association with legitimacy (H_5)—i.e. that social identity moderates the association between procedural justice and legitimacy, as proposed by the GVM and UMM—and that social identity mediates the link between procedural justice and legitimacy (H_6), as proposed by the GEM.

The second objective of this review is to address the shift of measurement of social identity in PJT studies. Measuring social identity as identification with a superordinate group and as relational identification with the police are based on two rather different sets of assumptions, and we expect to see a difference in the strength of the correlation between social identity and legitimacy between studies adopting different measures.

The third and last objective of this review is to address the (in)variant effect of procedural justice on legitimacy. As mentioned in our literature review, there is still an ongoing debate on the (in)variant effect of procedural justice on legitimacy. To test the effect of contextual factors, a few commonly reported demographics and ratings about the countries in which the studies were carried out were included in our analysis.

Methodology

Selection criteria and search strategy

There are three criteria to select relevant studies for the current study. First of all, since Tyler's (1990) Chicago study is generally regarded as a foundation for researching PJT in the criminal justice setting, this study thus looks for studies published in/after 1990. Secondly, as this study is interested in the relationship between procedural justice, social identity, and legitimacy, only studies reporting correlations, or other convertible estimates, between any two of these variables are included. Lastly, the focus of this study is on the police-public relationship: only studies with a focus on policing are included. Based on these criteria, four groups of search terms are created: (1) (police OR policing OR "law enforcement"), (2) ("procedural just*" OR "procedural fair*"); (3) (identity OR identification), and (4) (legitimate OR legitimacy). Since we are only interested in policing studies, the first group was combined with two of the remaining three groups to form three searches that were conducted on Abstract/Title/Keywords across three academic research databases commonly used in social science, psychology, and criminology: Scopus, Web of Science, and ProQuest. To reduce publication bias, grey literature, such as unpublished theses, is included.

The search results were then exported for further screening. After eliminating duplicated studies, 1635 studies were included in the title/abstract screening, of which 642 were subsequently included in the full-text screening. Studies were excluded if their focus of research is not procedural justice policing ('topic'), not using quantitative research methods ('methods'), or not measuring at least 2 variables that our study is interested in ('measures'). Updated searches were performed in October 2022 (four months after the initial search). With additional studies from update searches, 123 studies and 159 samples were included in data extraction and analysis (see Fig. 1).

Data extraction and analysis

After screening, appropriate data were extracted from the included studies for further analysis (see Table 4 in the Appendix). While zero-order correlations were prioritised, other available statistics were extracted and converted into correlations for the studies that do not report bivariate correlations between variables. For instance, standardised beta weights were imputed into correlation coefficients r by using Peterson and Brown's (2005) method. Together with sample size, Fisher's z transformation of correlations then could be performed. To deal with missing data, authors were contacted with a request to provide the missing data. In total, we have correlations between procedural justice and legitimacy from 152 samples, the correlations between social identity and legitimacy from 22 samples, the correlations between procedural justice and legitimacy from 26 samples, and the correlations between the interaction item (between procedural justice and legitimacy) and legitimacy from 11

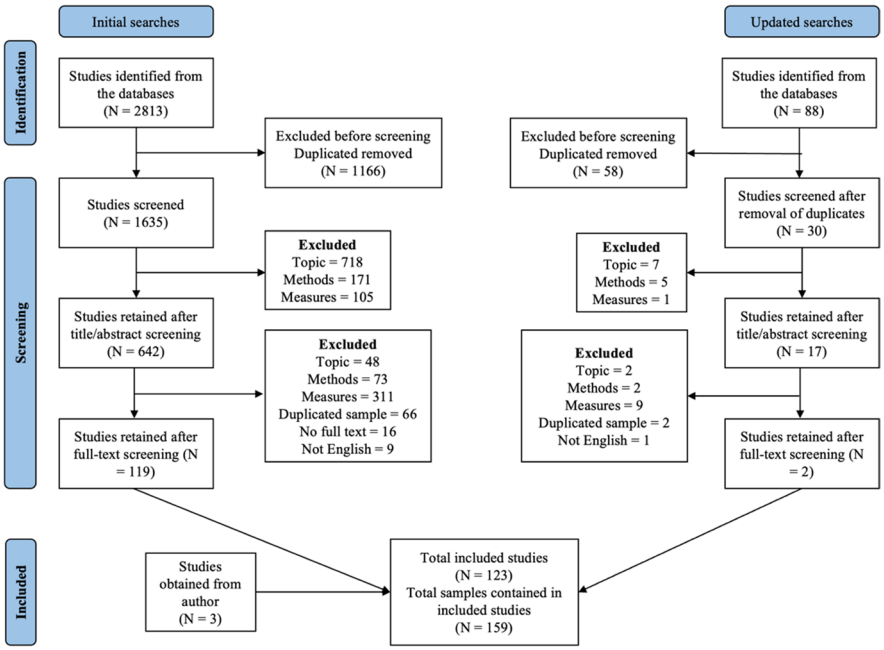

Fig. 1 PRISMA flow diagram

samples. As considerable between-study heterogeneity is anticipated, random effect models were used to pool effect sizes. The heterogeneity variance τ^2 was calculated with the restricted maximum likelihood estimator (Viechtbauer, 2005), while the confidence interval around the pooled effect was computed with *Knapp-Hartung adjustments* (Knapp & Hartung, 2003).

To perform moderator analyses, corresponding data were extracted. The mean age, proportion of males, and ethnic minority proportion of every sample have been recorded to test the effect of these demographics. For democracy and social development level, the latest ratings of the Democracy Index (The Economist Intelligence Unit, 2021) and the Human Development Index (United Nations Development Programme, 2022) of the countries in which the studies were conducted were extracted. Furthermore, to address the effect of how social identity was measured, the studies were coded into (a) in- vs out-group identification, (b) social identification with the superordinate group, or (c) relational identification with the police for their measure of social identity.

The analysis was conducted in R mainly with the packages 'meta', 'metaSEM', and 'dmetar'. Three random effects meta-analyses were conducted to test our first, second, and fifth hypotheses. Based on the assumption that procedural justice perception and social identification are contextual and situational, the random effect model, rather than the fixed effect model, is thus preferred to be used, as considerable between-study heterogeneity is expected in this meta-analysis (Harrer et al., 2021). Univariate effect sizes for correlations between procedural justice (PJ) and legitimacy (Legit) and between social identity (SI) and Legit are pooled from

included studies. To assess the effect of interaction between PJ and SI, the correlations between the interaction item (PJ × SI) and Legit were pooled from included studies. For each random effects meta-analysis, heterogeneity (which measures the between-study differences) was assessed with the Q and I^2 (Higgins & Thompson, 2002). Influence diagnostics (a test to identify and the cases that cause considerable changes in the fitted model) based on leave-one-out analysis are performed to minimise the effect caused by outliers and influential cases (Viechtbauer & Cheung, 2010), while Duval and Tweedie's (2000) trim and fill procedure (a method to estimate effect size from unpublished studies) is used to address the potential publication bias.

Apart from random effects meta-analysis, random effects two-stage structural equation modelling was adopted to test H_3, H_4, and H_6. Using a structural equation modelling approach in the meta-analysis, the two-stage analysis first pools the correlation matrices from included studies and then treats the pooled correlation matrix as if an observed correlation matrix to fit structural equation models. This approach allows us to perform meta-analysis within the more flexible framework offered by structural equation modelling (Cheung, 2015). Our analysis involves two models: (1) a multivariate model with PJ and SI as independent variables and Legit as the dependent variable and (2) a mediation model with SI as a mediator of the relationship between PJ and Legit. Lastly, to address the possible effect of contextual factors, meta-regression (testing the effect of moderator variables on effect sizes) and subgroup analysis (testing between-group difference in effect sizes based on the subgroups from our moderator variables) were conducted for continuous and categorical variables respectively.

Results

There are 159 samples from 123 studies ($N = 200{,}966$) being included in the present meta-analysis (see Table 5 in the Appendix for the summary). While the majority of included studies ($k = 152$) measure police procedural justice and legitimacy, 22 samples measure social identity and legitimacy, and 19 samples reported all three correlations of interest (PJ-Legit, SI-Legit, and PJ-SI). Table 1 summarises the results of the random effect meta-analysis on the correlations of PJ-Legit, SI-Legit, and PJ × SI-Legit. First, the results show that both pooled correlations between PJ and Legit, and between SI and Legit are significant, with mean effect sizes of 0.407 ($p < 0.0001$) and 0.392 ($p < 0.0001$), respectively. There is also strong evidence of heterogeneity (Q statistic and I^2) in both analyses. Based on the influence diagnostics (Viechtbauer & Cheung, 2010), findings from Jackson et al., (2022a) and Jackson et al., (2022b) are regarded as influential cases in the meta-analysis of the correlation between PJ and Legit, while Bradford, et al., (2014b) is the influential case in that of the correlation between SI and Legit. After the removal of influential cases, the mean effect sizes of both PJ–Legit and SI–Legit correlation were 0.397 ($p < 0.0001$) and 0.358 ($p < 0.0001$), respectively, which are slightly lower than the results without the elimination of influential cases

Table 1 Random-effects meta-analysis

Path	*k*	*N*	COR (95% CI)	*p*	Heterogeneity analysis				Trim and fill method			
					Q	df	*p*	I^2 (%)	Number of studies added	*k*	Adjusted COR (95% CI)	*p*
PJ–Legit	152	200,966	0.407 (0.369, 0.444)	< 0.0001	15,095.47	151	0	99.0	16	168	0.353 (0.307, 0.397)	< 0.0001
PJ–Legit (infl. cases removed)[1]	150	200,966	0.397 (0.361, 0.432)	< 0.0001	12,025.40	149	0	98.8	14	164	0.353 (0.311, 0.393)	< 0.0001
SI–Legit	22	200,966	0.392 (0.293, 0.484)	< 0.0001	1174.54	21	< 0.0001	98.2	4	26	0.318 (0.194, 0.431)	< 0.0001
SI–Legit (infl. cases removed)[2]	21	200,966	0.358 (0.280, 0.430)	< 0.0001	453.04	20	< 0.0001	96.0	3	24	0.318 (231, 400)	< 0.0001
PJ × SI–Legit	11	200,966	−0.002 (−0.111, 0.107)	0.964	264.30	10	< 0.0001	96.2	0	11	−0.002 (−0.111, 0.107)	0.964
PJ × SI–Legit (infl. cases removed)[2]	10	200,966	−0.044 (−0.108, 0.021)	0.162	76.25	9	< 0.0001	88.2	0	10	−0.044 (−0.108, 0.021)	0.162

[1]removed as outliers: Jackson et al., (2022a) and Jackson et al., (2022b); [2] removed as outliers: Bradford et al., (2014b)

yet remain strongly significant. To address potential publication bias, Duval and Tweedie's (2000) trim and fill method was used, and the adjusted results, for both PJ–Legit and SI–Legit correlation regardless of removal of influential cases, were similarly lower than before adjustment but still significant. Overall, the associations between both procedural justice and social identity and legitimacy are significant, regardless of the adjustments from the trim and fill method and the removal of influential cases.

To control the effect of procedural justice and social identity against each other, both effect sizes of PJ and SI were imputed into a multivariate model. By conducting two-stage structural equation modelling with the R package 'metaSEM', a multiple regression model with PJ and SI as the independent variables was estimated. The results show that the partial effects of PJ and SI on Legit are 0.287 and 0.267 (95% CI [0.230, 0.337] and [0.175, 0.355]), respectively. The correlation between PJ and SI was 0.356 (95% CI [0.258, 0.454]). The effects of procedural justice perception and social identity on legitimacy judgement were similar and significant.

After testing the effect of PJ and SI in univariate and multivariate models, a random-effect meta-analysis is performed for the effect of interaction between PJ and SI (PJ × SI) on Legit (see Table 1) (i.e. the identity moderation hypothesis). The results suggest that the pooled PJ × SI–Legit correlation tends to be negative but insignificant, regardless of the influential cases removal. Duval and Tweedie's (2000) trim and fill method suggests that no studies are to be added to adjust for the potential publication bias. The correlation between PJ × SI and Legit is found to be insignificant.

To test the identity meditation hypothesis, effect sizes of PJ-Legit, SI-Legit, and PJ-SI are taken into a random effect two-stage structural equation modelling meta-analysis with the R package 'metaSEM'. Since most studies only measure or report the PJ-Legit correlation, only matrices from those reporting all three correlations ($k = 19$, $N = 26{,}169$) were positive definite and thus included. The results show that all three paths (PJ-Legit, SI-Legit, and PJ-SI) are significant with the effect sizes of 0.430, 0.250, and 0.311 (95% CI [0.307, 0.551], [0.143, 0.351], and [0.214, 0.407]), respectively, whereas the indirect effect was also significant with estimate of 0.078 (95% CI [0.048, 0.115]). Moreover, the mediation model fits the data closely, with $\chi^2_{26,169} < 0.001$ ($p < 0.001$), RMSEA < 0.001, and CFI ≈ 1.0.

Table 2 Meta-regression results

Moderator	PJ–Legit			SI–Legit		
Continuous	*F*	df1, df2	*p*	*Q*	df1, df2	*p*
Age	3.929	1, 120	0.050*	0.309	1, 17	0.586
Gender	1.335	1, 132	0.250	0.007	1, 18	0.933
Ethnicity	0.084	1, 72	0.773	0763	1, 15	0.396
Democracy Index	2.069	1, 148	0.152	0.020	1, 21	0.889
Human Development Index	6.288	1, 149	0.013*	0.007	1, 23	0.931

*$p < 0.05$

Finally, moderator analyses were conducted on the meta-analysis results of PJ–Legit and SI–Legit to test the effect of contextual factors (see Table 2). For the effect of demographic differences including age, gender, and ethnicity, the only significant result is that age significantly moderates the PJ–Legit relationship (F (1, 120) = 3.929, p = 0.050). This suggests that procedural justice may be a more important predictor of legitimacy among adolescents and young adults than older individuals. Regarding the effect of social contexts, results show that social development has a significant effect on PJ–Legit correlation (p = 0.013). People from more developed countries tend to correlate procedural justice perception to legitimacy more strongly than those from developing countries. On the other hand, none of the contextual factors in our analysis seem to moderate the correlations between social identity and legitimacy.

Table 3 summarises the results of subgroup analysis on social identity measures. The way how social identity was measured in PJT studies significantly affects the correlation between social identity and legitimacy (p = 0.011). Among all, measuring social identity as relational identification with the police provides the strongest mean effect size on SI–Legit correlation with the lowest heterogeneity (cor = 0.551, 95% CI [0.422, 0.658], I^2 = 64.6%).

Discussion

Since Tyler's (1990) ground-breaking research on procedural fairness in criminal justice settings, criminologists have been investigating how procedural justice could be used to promote police legitimacy and public compliance. Although social identity was central in developing different relational models of procedural justice in early PJT research (e.g. Lind & Tyler, 1988; Tyler & Blader, 2000; Tyler & Lind, 1992), until recently, few criminological studies have focussed on the psychological processes underpinning the link between procedural justice and legitimacy. However, given recent attention to the role of social identity (26 studies in our review addressed social identity, 21% of all included studies), this is a timely moment to consider the place of social identity in our understanding of police procedural justice and legitimacy.

This meta-analysis addressed the interplay between procedural justice, social identity, and legitimacy in policing, as well as the potential effect of contextual factors on these relationships. Our findings suggest, first, that both procedural justice and social

Table 3 Subgroup analysis of social identity measure

	k	**SI-Legit** COR (95% CI)	I^2 (%)	$p_{subgroup}$
SI measures				0.011
Superordinate group identification	18	0.360 (0.242, 0.467)	98.5	
Relational identification	4	0.551 (0.422, 0.658)	64.6	
In-group vs out-group	1	0.460 (0.404, 0.513)	-	

identity are correlates of legitimacy (H_1 and H_2). Moreover, when entered into a multivariate model, both procedural justice and social identity positively predict legitimacy while controlling for the effect of each other. In this limited sense, procedural justice and social identity have 'unique' statistical effects on legitimacy (H_3 and H_4).

With the foundation built upon H_1 to H_4, the social identity moderation and mediation hypotheses were then tested. Results suggest that the correlation between the interaction between procedural justice and social identity and legitimacy is non-significant, albeit with a tendency towards the negative. This implies that the strength of identification with the social group associated with police does not moderate the association between procedural justice and legitimacy. H_5 is thus rejected; our meta-analysis does not support the GVM or the UMM. This result has to be interpreted carefully, however, because the meta-analysis was conducted using only 11 samples, which are mostly from studies in the UK and Australia.

Nevertheless, social identity is found to be a significant *mediator* of the correlation between procedural justice and legitimacy of the police. H_6 is thus supported, and we find evidence in support of the GEM. We note that the putative causal relationship between these variables—i.e. that the experience of procedural justice strengthens identification with the group, and thus legitimacy—is assumed theoretically but very rarely empirically tested. More longitudinal and experimental studies are needed to the underlying causal processes. In addition, with the majority of the 19 included studies included in the mediation analysis conducted in the UK and Australia, the generalizability of these findings could be limited.

Our second objective was to review the implications of the differences in measuring social identity across existing PJT studies. Our findings suggest that measuring social identity as relational identification with the police shows a stronger correlation with legitimacy judgements and a lower heterogeneity than the other two ways of measuring social identity. This lower heterogeneity suggests that there are fewer unaddressed contextual effects on the results, which could imply that measuring social identity as relational identification with the police is less context-dependent than the other approaches. Measuring social identity via identification with superordinate group(s) relies on the assumption that police are seen as a significant prototypal representative of the group. This tends to overlook to the fact that there are likely to be many factors shaping this identification that are not associated with police. Thus, considering relational identification with the police in the conceptualisation and operationalization of social identity in policing PJT research might be a more accurate way to assess how identity processes shape and interact with the relationship between procedural justice and legitimacy. That said, our findings do identify an association between superordinate identification and legitimacy, which may among other things say something about how police legitimacy is reproduced over time. People who identify with dominant groups in society tend to legitimise police, and this is to some extent independent of their assessments of procedural justice (Bradford, 2016).

Our last objective was to test the 'invariance thesis'. Our results suggest that the correlation between procedural justice and legitimacy seems to be moderated by age and social development level. The correlation between the two tends to be stronger among younger people, and those from more developed countries. This does not mean that procedural justice is not important for others (e.g. older people), but it

does suggest that other antecedents of legitimacy could be relatively more salient to them. Given that legal socialisation has been one of the focuses in PJT studies (e.g. Trinkner & Tyler, 2016; Trinkner et al., 2020), it is perhaps not surprising that age acts as a moderator.

By contrast, although the policing of ethnic minority communities has been a concern particularly in western countries, in part because of the historical intergroup relationship between the police and the ethnic minority communities (e.g. Boehme et al., 2022; Jackson et al., 2023; McLean, 2017), our findings show that ethnicity does not seem to moderate the association between procedural justice and legitimacy. While Sun and Wu (2022) concluded that race/ethnicity moderates the effect of procedural justice on legitimacy by reviewing US-based studies, this phenomenon might be confined in the USA, or to other contexts marked by significant (racial/ethnic) intergroup tensions. We did identify potential moderating effects from gender, or the level of democracy. In addition, no significant impact was found from our hypothesised moderators on the correlation between social identity and legitimacy. This could imply that social identity predicts legitimacy to a similar extent across people from different demographic backgrounds and social contexts. The association between social identity and legitimacy may therefore be less "context dependent" than might be imagined.

In sum, the meta-analysis seems more supportive of the invariance thesis than not. In general, the associations between procedural justice and legitimacy (and between social identity and legitimacy) do not seem to vary much across people from different demographic backgrounds and social contexts—although this is a mixed picture, and more work would be needed to expand on the limited findings presented here.

Implications

Our findings have significant implications for PJT in both theory and practice. Coherent with many previous studies, including the meta-analysis conducted by Walters and Bolger (2019), we find that procedural justice significantly correlates with legitimacy. But we also show that social identity can also be a significant antecedent of legitimacy, even taking procedural justice into account. Our analysis addresses the social identity mediation and moderation hypotheses and indicates support for the GEM. It seems that procedural justice treatment from the police can shape people's identification with the superordinate group embodied, or the social group represented, by the police, such that, in turn, the police as in group members tend to be perceived as more legitimate.

Our second theoretical contribution concerns the conceptualisation and operationalisation of social identity in PJT. As mentioned, there has been a shift in quantifying social identity in survey studies away from simply measuring presumed shared social group towards a relational approach and measuring identification with police as a distinct social category. Our subgroup analysis considering different approaches to measuring social identity suggests that relational identification with the police seems to be a less context-dependent predictor of police legitimacy, meaning that it could be

more 'accurate' to consider, and measure, social identity as relational identification. However, it is also the case that there is consistent evidence of associations between police procedural justice and the strength of identification with more expansove categories, such as 'the community', or even 'the state' in a broader sense (Blount-Hill & Gau, 2022). In sum, it would seem that measures of both types of identity have a role to play, and future studies concerned with the mediating role of identity should consider including both. Again, though, existing PJT studies focussing on social identity are largely from the UK and Australia; other countries were underrepresented in current findings.

Lastly, our moderator analysis addresses some contextual variance of how procedural justice and social identity correlate with legitimacy. It seems that age and social development level are significant moderators of the correlation between procedural justice and legitimacy, but gender, race/ethnicity, and level of democracy are not. The correlation between *social identity* and legitimacy was not moderated by any of the variables that we tested. This could imply that the effect of procedural justice on legitimacy can vary depending on background and context, whereas the link between social identity and legitimacy is more consistent. The effectiveness of police attempts to promote legitimacy via procedural justice may thus also vary by context: perhaps most obviously, it would seem that procedural justice might be particularly important for younger people.

Limitations

This review has several limitations. First, although PJT can be applied in other criminal justice settings, such as courtrooms and prisons, as well as the workplace and elsewhere, this study confines its scope to the context of policing, and thus, results are limited in this area. Second, while this study focuses on the relationship between procedural justice perceptions, social identity, and legitimacy judgements, future studies on social identity in PJT could usefully be extended to include behavioural measures, such as compliance and cooperation with the police.

Third, among the 159 included samples, only 11 of them reported the correlation between the procedural justice—social identity interaction and legitimacy judgements. Similarly, there are a very limited number of studies measuring social identity as in-group vs out-group and relational identification. Although it is possible to conduct a meta-analysis on a small number of studies, the estimation of between-study heterogeneity could be difficult and may result in biased effect estimates (von Hippel, 2015).

Fourth, this review only includes studies in English. More inclusive analysis could be done if studies in other languages can be included in the future. This also leads to another limitation that most studies are representative of dominant group members in English-speaking countries (i.e. white Americans, white Europeans) but not of minorities, although a few do focus on ethnic minority groups. Finally, the specific social and indeed policing situations upon which some studies focussed were not taken into account in our analysis. Results from studies on crowd policing could be quite different from those focussing on more 'routine' police encounters, for example because

encounters in crowd events are conceptualised as *inter-group* contact rather than *inter-personal*, as in many 'routine' interactions with the police (Reicher et al., 2004).

Conclusion

Given its recent attention in policing PJT research, this paper offers a timely review on the effect of social identity and social contexts on the extent to which police procedural justice leads to legitimacy. By using a meta-analytical approach, this study systematically reviews published evidence of the potential effects of social identity and contextual factors on the relationship between procedural justice and legitimacy in the context of policing. Controlling for procedural justice, social identity is found to be significantly correlated with legitimacy: identification seems to be another important source of police legitimacy. Moreover, our findings support the GEM, and the idea that procedural justice perceptions shape social identification with groups, which in turn shapes legitimacy judgements. By contrast, social identity seems not to moderate the link between procedural justice and legitimacy; our findings are less supportive of the GVM and UMM of procedural justice. By testing these relational models of PJT, this paper points out that social identity can be one of the important social psychological processes mediating the relationship between the perception of procedural justice and legitimacy and therefore that our assumptions about their relations need to be revisited through further research.

The question of contextual variance in the extent to which procedural justice and social identity correlate with legitimacy was addressed via moderator analysis. Age and social development level were found to have significant impacts on the correlation between procedural justice and legitimacy, whereas the correlation between social identity and legitimacy is not affected by any hypothesised moderators. In other words, social identity may be a less context-dependent predictor of legitimacy, whereas the effect of procedural justice can vary across different social groups and settings. While the content of social identity (i.e. beliefs about what it means to be a member of a social category) and group boundaries (i.e. who is in-group or out-group) can be highly dependent on social contexts, our study indicates that future PJT research should steer towards understanding the precise context of situationally embedded interactions with police, as well as the interplay of multidimensional group identities.

Taken together, our findings demonstrate the potential importance of social identities and social contexts for understanding how and why procedural justice encourages legitimacy judgements. While Hamm et al. (2022) called for a more precise conceptualisation of legitimacy, they also placed the dialogic components of legitimacy at the core of their model. Our analysis of the available evidence suggests that social identity is an important component in the dialogue of legitimacy and that this social psychological factor interacts with context to play an important role in the interactional dynamics between police and citizens. Currently, PJT research has been dominated by survey methodology, where, inevitably, measures of identity are rather blunt and static. We suggest that PJT studies could therefore fruitfully adopt more diverse methodologies in the future so that the types of embedded group identities likely to be important for legitimacy can be conceptualised more precisely.

Appendix

Table 4 Summary of included studies

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
Akinlabi (2017)	305	HST	Nigeria	15.14	56	45	P	C		0.14			
Akinlabi (2018)	600	Adults	Nigeria	32.70	49	27	P	C		0.07			
Aksu (2014)	500	HST	Turkey	14.58	48		NP	C		0.57			
Aviv and Weisburd (2016)	3826	Adults	Israel	43.90			P	C		0.56			
Baz and Fernández-Molina (2018)	2041	Youth	Spain	15.33	49	18	P	C		0.57			
Bello and Matshaba (2021)	482	UST	South Africa	23.00	22	8	P	C		0.28			
Blount-Hill (2020)	807	Adults	USA	38.00		84	NP	C	I/O	0.42	0.46		
Boateng and Darko (2021)	251	Adults	Ghana	29.00	55		P	C		0.09			
Boateng et al. (2022)	3627	Adults	South Africa and Sierra Leone		42		P	C		0.20			
Bradford et al., (2014a)	3183	Adults	South Africa	40.56	60	43	P	C		0.42			
Bradford et al., (2017a, b)	1004	Adults	UK		47	12	P	C	S	0.68	0.47	−0.15	0.38
Bradford et al., (2014b)	1023	Adults	Australia	56.00	46	56	P	C (L)	S	0.71	0.83	0.39	0.46
Bradford et al. (2020)	1092	Adults	UK		44	27	P	C		0.47			
Brown (2019)	525	UST	USA		32	61	NP	E		0.47			
Buzarovska et al. (2014)	487	Adults	Macedonia		32		P	C		0.30			
Cavanagh et al. (2021)	417	EM youth	USA	15.43		100	P	C		0.53			
Chenane et al. (2022)	449	Immigrants	USA	39.46	0	100	P	C		0.29			
Cherney and Murphy (2013)	302	EM	Australia	38.94	54	100	P	C	S	0.59	0.37		0.27
Dittloff (2003)	119	Hispanic students	USA	26.60	31	100	NP	C	S				0.03
Factor et al. (2014)	1216	Adults	Israel	42.03	50	33	P	C		0.64			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
Ferdik (2014)	623	UST	USA	20.43	54	56	P	C		0.64			
Ferdik et al. (2014)	296	UST	USA	21.3	42	83	P	C		0.44			
Fine et al. (2022)	1216	Offenders	USA	15.29	100	85	P	C		0.43			
Fine and van Rooij (2021)	1000	Adults	USA	45.35	49	25	P	C		0.75			
Gau (2010)	1029	Adults	USA	45.35	49	25	P	C (L)		0.32			
Gau et al. (2012)	531	Adults	USA	54.92	33	36	P	C		0.74			
Granot et al. (2021)	1228	HST	USA	15.74	49	65	P	C		0.47			
Grant and Pryce (2020)	163	Adults	Jamaica	27.56	53		P	C		0.32			
Hamm et al. (2019)	508	Adults	USA		55	29	P	E		0.15			
Hamm et al. (2017)	610	Adults	USA	38.00		19	P	C		0.61			
Henry and Franklin (2019)	201	Adults	USA	34.51	66	30	P	C		0.47			
Hertogh (2015)	11,182	Traffic offenders	Netherlands	43.10	71		P	C		0.28			
Hinds (2007)	328	Youth	Australia	15.3	51	26	NP	C		0.36			
Hinds and Murphy (2007)	2611	Adults	Australia	48.54	44	10	P	C		0.51			
Huq et al., (2017)	1004	Adults	UK				P	C		0.60			
Jackson et al. (2014)	404	Adults	Pakistan		78		P	C		0.33			
Jackson et al., (2022a)	2507	Adults	Canada				P	C		0.88			
Jackson et al. (2013)	1017	Adults	UK	23.00	100	100	P	C	S	0.68	0.24		0.28
Jackson et al., (2022b)	928	Adults	Brazil				P	C (L)		0.86			
Jackson and Sunshine (2007)	1023	Adults	UK	55.46	45		P	C	S				0.77
Jeleniewski (2014)	198	HST	USA	12.21	39	39	NP	C (L)		0.28			
	392	HST	USA	12.07	48	49	NP	E		0.16			
Johnson et al. (2014)	603	Adults	Trinidad and Tobago				P	C		0.59			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
Jorgensen (2011)	337	Arrestees	USA	31.52	75	45	NP	C		0.77			
Karakus (2017)	1800	Adults	Turkey	42.68	41		P	C		0.37			
Kim et al. (2019)	1241	Drivers	South Korea				P	C		0.21			
Kochel (2017)	2969	Adults	Trinidad and Tobago				P	C		0.43			
Kochel (2018)	947	Adults	USA	38.00	40	80	P	C		0.50			
Kruger et al. (2015)	1069	Adults	USA	53.00	27	24	P	C		0.40			
Kyprianides et al. (2021)	509	Adults	UK		50	13	P	C	R	0.36	0.46		0.32
	200	Homeless	UK		87	63	P	C	R	0.74	0.60		0.53
Lawrence et al. (2021)	1072	Adults	USA	31.00	48	44	P	C		0.50			
Lee and Lee (2021)	2188	UST	South Korea	21.50	47		P	C		0.54			
Lee and Cho (2020)	1018	Adults	South Korea		51		P	C		0.40			
Li (2018)	5178	Adults	USA	47.23	57	21	NP	C		0.51			
Lim and Kwak (2022)	772	Adults	South Korea	40.70	50		P	C		0.64			
Liu et al. (2020)	202	Drug abusers	China	33.62			P	C		0.66			
Liu and Nir (2021)	140	Defence attorneys	USA				P	C		0.28			
Lorenz (2017)	414	Victims	USA		5	34	NP	C		0.51			
Lowrey et al. (2016)	179	UST	USA		31	30	P	E		0.28			
Lukic et al. (2016)	143	UST	Slovenia	21.68	31		P	C		− 0.05			
	149	UST	Serbia	21.68	31		P	C		0.08			
Madon and Murphy (2021)	398	Muslim immigrants	Australia	32.59			P	C		0.49			
Madon et al., (2017a)	800	Muslims	Australia	34.89			P	C	S	0.68	0.39		0.54
Madon et al., (2017b)	1480	EM adults	Australia	39.17	50	100	P	C	S	0.48	0.22		0.22
Madon et al. (2022)	504	Muslims	Australia	38.20	50		P	E		0.62			
McLean (2018)	1432	Adults	USA				NP	E		0.27			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
McLean and Nix (2021)	701	Adults	USA	46.07	48	38	P	C		0.64			
Mentovich et al. (2020)	390	Adults	Israel	35.56	51	0	P	C	S	0.75	0.54		0.58
Muratbegovic et al. (2014)	583	UST	Bosnia and Herzegovina	22.50	36		P	C		0.71			
Murphy (2013)	908	EM	Australia	39.14		100	P	C	S	0.53	0.19	−0.02	0.12
Murphy (2015)	513	Adolescents	Australia	15.18	51		P	C		0.31			
Murphy et al. (2022)	903	Immigrants	Australia	33.71	50		P	C	R				0.58
Murphy and Cherney (2011)	1204	Adults	Australia	56.13	46	19	P	C	S	0.63	0.29	-0.01	0.24
Murphy and Cherney (2018)	9420	Adults	Australia	50.07	60	84	P	C	S	0.63	0.31	-0.04	0.28
Murphy et al. (2008)	2611	Adults	Australia	48.54	44	10	P	C		0.43			
	102	Adults	Australia	56.19	37	14	P	C (L)		0.42			
Murphy et al. (2017)	10,148	Adults	Australia	50.07	40	16	P	C					0.13
Nalla and Nam (2021)	845	Adults	India		77		P	C		0.39			
Nam et al. (2022)	1681	Adults	USA	56.92	36	57	P	C		0.29			
	972	Adults	USA	46.97	49	49	P	C		0.47			
Nix et al. (2015)	1628	Adults	USA	57.84	34	48	P	C		0.37			
Nuno (2017)	2268	Arrestees	USA	31.95	76	63	NP	C		0.17			
								C		0.33			
Paek et al. (2019)	436	Private security officers	South Korea	47.87	94		P	C		0.40			
Peacock (2018)	1964	Adults	Ukraine	44.10	45		NP	C		0.47			
Pearce et al. (2020)	1505	Adults	UK		50	15	P	E	R				0.81
	1500	Adults	Denmark		50	8	P	E	R				0.75
Pehrson et al. (2017)	819	Youths	UK	14.80	42	5	P	C	S	0.61	0.23	−0.04	0.31
Perry et al. (2017)	470	Protestors	Israel	32.00	57	10	P	C		0.55			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
Piccirillo et al. (2021)	669	Adolescents	Brazil	14.50	50	52	P	C (L)		0.48			
Pina-Sanchez and Brunton-Smith (2020)	1354	Young offenders	USA	16.00			P	C (L)		0.26			
Pryce (2014)	304	Immigrants	USA	40.26	46		NP	C		0.56			
Pryce and Grant (2020)	163	Adults	Jamaica	27.56	53		P	C		0.32			
Radburn et al. (2018)	103	Adults	UK	34.00	43		P	E	R	0.70	0.62		0.74
	142	Football fans	UK	36.00	83	8	P	E	R	0.38	0.56		0.67
Reisig et al. (2007)	432	Adults	USA	47.79	46	17	P	C		0.65			
Reisig et al. (2021)	1000	Adults	Slovenia	39.46	47		P	C		0.25			
Reisig and Lloyd (2009)	289	Adolescents	Jamaica		59		P	C		0.15			
Reisig et al. (2014)	683	HST	Slovenia	18.33	39		P	C		0.52			
Rengifo and Slocum (2020)	451	EM youths	USA		74	100	P	C		0.23			
Rodrigues and Medina (2021)	724	Children	Brazil	13.00	50	53	P	C (L)		0.06			
Sargeant et al. (2022)	779	Adults	Australia				P	C		0.74			
Saulnier and Sivasubramaniam (2021)	278	UST	Australia	33.44	24	15	P	E	I/O				0.22
Silver (2020)	961	Adults	USA	37.04	50	16	P	E		0.18			
Solomon (2018)	669	UST	USA	21.41	47	28	NP	E		0.49			
Solomon and Chenane (2021)	560	Adults	USA	45.38	50	24	P	E		0.10			
Sun et al. (2017)	929	Adults	China	37.44	47		P	C		0.33			
Sunshine and Tyler (2003b)	586	Adults	USA	48.00	38	43	P	C	S	0.58	0.13	−0.24	
Sunshine and Tyler (2003a)	1422	Adults	USA		45	56	P	C		0.40			
Tankebe (2009)	374	Adults	Ghana	31.00	61		P	C		0.33			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
Tankebe and Asif (2016)	510	Young adults	Pakistan		0.74		P	C		0.18			
Trinkner and Cohn (2014)	322	HST	USA	16.39	41	14	P	C		0.63			
	259	Youths	USA	19.24	34	13	P	C		0.62			
Trinkner et al. (2019)	393	Youths	USA	17.90	30	15	P	E		0.27			
Trinkner et al., (2020)	743	HST	Brazil	11.96	50	50	P	C		0.43			
Tsushima and Hamai (2015)	1251	Adults	Japan	50.90	50		P	C		0.38			
Tyler (2005)	1653	Adults	USA			65	P	C		0.29			
Tyler and Jackson (2014)	1603	Adults	USA		48	28	P	C	S	0.46	0.33		0.28
Tyler et al. (2010)	300	Muslims	USA	38.00	47		P	C	S	0.31	0.21		
Van Damme (2017)	762	Adults	Belgium	48.65	49		P	C		0.49			
Van Damme and Pauwels (2016)	1659	UST	Belgium		26		P	C		0.46			
Van Petegem et al. (2021)	268	Adolescents	Belgium	15.70	34		P	C		0.29			
Ward (2022)	600	Adults	USA	50.50	47	43	P	C		0.44			
Watson et al. (2021)	1896	Adults	Tuvalu	37.14	48		P	C		0.47			
Wolfe and McLean (2021)	2086	Adults	USA	45.98	49	38	P	E	S	0.09	0.52		0.02
Woo et al. (2018)	301	UST & adults	South Korea	27.75	47		P	C		0.56			
Wu and Miethe (2022)	3306	Adults	USA		52	32	P	C		0.80			
Zahnow et al. (2021)	4227	Adults	Australia	51.26	41	9	P	C		0.47			
Studies with raw data extracted													
European Social Survey European Research Infrastructure (2018)	2259	Adults	Austria	45.28	48		P	C		0.27			
	1704	Adults	Belgium	46.76	48		P	C		0.13			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
	2430	Adults	Bulgaria	53.38	44		P	C		0.20			
	1502	Adults	Switzerland	47.81	51		P	C		−0.02			
	1069	Adults	Cyprus	48.11	45		P	C		0.20			
	2386	Adults	Czechia	46.96	50		P	C		0.02			
	3026	Adults	Germany	47.61	51		P	C		0.12			
	1576	Adults	Denmark	48.48	51		P	C		0.14			
	1793	Adults	Estonia	48.69	40		P	C		0.12			
	1880	Adults	Spain	45.85	49		P	C		0.12			
	1878	Adults	Finland	48.83	49		P	C		0.16			
	1728	Adults	France	49.41	46		P	C		0.07			
	2413	Adults	UK	50.00	44		P	C		0.21			
	2714	Adults	Greece	47.60	44		P	C		0.20			
	1619	Adults	Croatia	50.90	44		P	C		0.20			
	1561	Adults	Hungary	47.61	46		P	C		0.12			
	2576	Adults	Ireland	46.14	46		P	C		0.24			
	2269	Adults	Israel	45.45	46		P	C		0.18			
	1636	Adults	Lithuania	51.97	36		P	C		0.13			
	1829	Adults	Netherlands	50.42	46		P	C		0.09			
	1548	Adults	Norway	46.38	52		P	C		0.22			
	1751	Adults	Poland	44.40	48		P	C		0.10			
	2150	Adults	Portugal	53.98	40		P	C		0.10			
	2594	Adults	Russia	46.42	41		P	C		0.21			
	1497	Adults	Sweden	48.60	48		P	C		0.15			
	1384	Adults	Slovenia	47.40	46		P	C		0.21			

Table 4 (continued)

Study	*n*	Sample	Location	Mean age	Male%	EM%	Pub	Design	SI measure	PJ-L	SI-L	PJ × SI-L	PJ-SI
	1846	Adults	Slovakia	50.58	39		P	C		0.02			
	1931	Adults	Ukraine	50.30	37		P	C		0.13			
MacQueen and Bradford (2013)	787	Drivers	UK	50.71	63		P	E (R)	S	−0.09	0.08	0.01	−0.15
Antrobus et al., (2015)	2746	Drivers	Australia	47.19	50		P	E (R)	S	0.09	0.18	0.08	−0.02

Study, studies included in current meta-analysis; *n*, sample size; sample, description of sample (*HST* high school student, *UST* university students, *EM* ethnic minority); location, country where the study was conducted; mean age, the mean age of samples; Male%, the proportion of male in samples (%); EM%, the proportion of ethnic minority in samples (%); Pub, publication status of studies (*P* published, *NP* not published); design, methodology used in studies (*C* correlational research design, *E* experimental research design, *L* longitudinal studies, *R* randomised controlled trials); SI measure, the way how social identity were measured in studies (*I/O* in- vs out-group identification, *S* identification with a superordinate group, *R* relational identification with the police); PJ–Legit, correlations between procedural justice and legitimacy judgement; SI–Legit, correlations between social identity and legitimacy judgement; PJ × SI–Legit, correlations between the interaction between procedural justice and social identity and legitimacy judgement; PJ–SI, correlations between procedural justice and social identity

Table 5 Summary of 159 samples from 123 studies included in the present meta-analysis

Study	Procedural justice	Social identity	Legitimacy
Akinlabi (2017)	12-item scale assessing views on police use of fair procedures (α = 0.78)		12-item scale measuring perceived obligation, trust in police, and alignment with public interest (α = 0.86)
Akinlabi (2018)	5-item scale assessing perceived neutrality, fairness, voice, and respect (α = 0.88)		5-item scale measuring perceived normative appropriateness of police behaviour (α = 0.86)
Aksu (2014)	8-item scale assessing perceived quality of decision-making and quality of treatment (α = NA)		10-item scale measuring obligation to obey and trust in police (α = NA)
Aviv and Weisburd (2016)	4-item scale assessing perceived quality of treatment and the quality of decision-making ((α = 0.77)		5-item scale measuring obligation to obey and trust in the police (α = 0.64)
Baz and Fernández-Molina (2018)	3-item scale assessing perceived respect, fairness, and willingness to explain the actions of the police (α = 0.80)		3-item scale measuring moral alignment and values shared by legal authorities and citizens (α = 0.81)
Bello and Matshaba (2021)	A scale assessing the fairness of the police (α = 0.79)		A scale measuring the views of participants on their readiness to obey and consider the police worthy of their deference (α = 0.94)
Blount-Hill (2020)	8-item scale assessing perceived procedural justice in last police encounter (α = NA)	A dichotomized measure assessing whether the government is viewed as in-group or out-group authority	17-item scale measuring criminal justice system legitimacy and the legitimacy of CJS actors (α = NA)
Boateng and Darko (2021)	6-item scale assessing the frequency with which the police engaged in behaviour consistent with procedural fairness in their neighbourhood (α = 0.76)		5-item scale measuring perceived trustworthiness, honesty, and confidence of police (α = 0.76)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Boateng et al. (2022)	2-item scale assessing the perceived frequency of police treating people with respect and making fair decisions (α = NA)		A single item measuring whether respondents considered it their duty to obey the police, even if they disagreed with the police (α = NA)
Bradford et al., (2014a)	3-item scale assessing trust in police in terms of respectfulness, impartiality, and willingness to engage in dialogue		5-item scale measuring self-assessed duty to obey police directives and sense of moral alignment with police
Bradford et al., (2017a, b)	4-item scale assessing perceived procedural fairness of the police, such as treating people with respect (α = NA)	4-item scale assessing views on how important the identity of a member of the British community and a law-abiding citizen to the respondents (α = NA)	6-item scale measuring felt obligation to obey police authority and views on whether the police acted in ways that aligned with their normative expectation (α = NA)
Bradford et al., (2014b)	4-item scale assessing trust in police procedural justice, such as treating people with respect and listen to people before making decisions (α = NA)	4-item scale assessing the subjective sense of importance of being an Australian and a law-abiding citizen (α = NA)	2-item scale measuring perceived duty to obey police (α = NA)
Bradford et al. (2020)	3-item scale assessing trust in police fairness, such as treating people with respect and listening to the concerns of local people (α = NA)		4-item scale measuring normative alignment and duty to obey police (α = NA)
Brown (2019)	4-item scale assessing perceived neutrality, respect, trustworthiness, and participation in the procedural injustice stimuli (α = NA)		3-item scale measuring felt obligation to obey, normative alignment, and trust in the police (α = NA)
Buzarovska et al. (2014)	10-item assessing perceived respect, fairness, dignity, and trustworthiness of the police (α = NA)		5-item scale measuring felt obligation to obey and trust in police (α = NA)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Cavanagh et al. (2021)	12-item scale assessing the perception of the way that police treated them during their arrest (α = 0.81)		6-item scale measuring perceived police legitimacy, such as felt obligation to support the police (α = 0.83)
Chenane et al. (2022)	4-item scale assessing perceived quality of treatment (α = 0.92)		Combined effect of two scales: a 3-item scale measuring felt obligation to obey the police and a 4-item scale measuring trust in the police (α = 0.72)
Cherney and Murphy (2013)	6-item scale assessing four constructs of procedural justice: voice, fairness, respect, and neutrality (α = 0.89)	4-item scale assessing the degree to which respondents identified with Australian society (α = 0.66)	5-item scale measuring feeling of trust and confidence in the police (α = 0.85)
Dittloff (2003)	25-item scale assessing perceived procedural fairness of police, in terms of standing, neutrality, trust, and process/decision control (α = 0.90)	2-item scale assessing superordinate group identification (α = 0.71)	
Factor et al. (2014)	A scale assessing the perception of police treating people with fairness, honesty, and respect, based on facts (α = 0.91)		A scale measuring felt obligation to obey and general support to the police (α = 0.87)
Ferdik (2014)	8-item scale assessing perceived quality of decision-making and quality of treatment (α = 0.89)		4-item scale measuring obligation to obey and trust in police (α = 0.71)
Ferdik et al. (2014)	9-item scale assessing perceived quality of decision-making and quality of treatment and frequency of making fair decisions and treatment (α = 0.95)		3-item scale measuring overall feelings of being obligated to obey officer directives (α = 0.55)
Fine et al. (2022)	Combined effects of three scales: a 2-item scale assessing voice (α = 0.71), 5-item scale assessing neutrality (α = 0.79), and a 2-item scale assessing respect (α = 0.69)		4-item scale measuring support for the police (α = 0.86)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Fine and van Rooij (2021)	3-item scale assessing the perceived frequency of police making fair decisions and explaining their decisions (α = 0.85)		4-item scale measuring support for the police (α = 0.95)
Gau (2010)	Combined effects of two scales: a scale assessing subjective rating of recent police contact quality and a scale assessing perceived stop legitimacy in recent contact (α = NA)		Single-item scale measuring the level of trust in police to protect them (α = NA)
Gau et al. (2012)	4-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.90)		3-item scale measuring the extent of believing local police to be trustworthy, to uphold people's rights, and to do their jobs well (α = 0.77)
Granot et al. (2021)	6-item scale assessing perceived quality of decisions and interpersonal treatment (α = 0.91)		Single-item scale measuring willingness to follow directives of police in their neighbourhood
Grant and Pryce (2020)	6-item scale assessing perceived quality of decisions and interpersonal treatment (α = 0.90)		4-item scale measuring level of obligation to obey the police (α = 0.80)
Hamm et al. (2019)	3-item scale assessing subjective rating of police's respect, impartiality, and willingness to listen (α = NA)		3-item scale measuring trust in police (α = NA)
Hamm et al. (2017)	Combined effects of two scales: a 3-item scale assessing perceived procedural unfairness (α = 0.89) and a 6-item scale assessing perceived procedural fairness (α = 0.89)		Combined effects of two scales: a 3-item scale measuring obligation to obey (α = 0.87) and a 3-item scale measuring normative alignment (α = 0.94)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Henry and Franklin (2019)	Combined effects of two dichotomized measures: one assessing whether an officer was perceived to behave properly and one assessing whether respondents felt being treated respectfully		A dichotomized measure of perceived legitimacy measuring whether respondents perceived recent police stop as legitimate
Hertogh (2015)	2-item scale assessing perceived fairness of the treatment and procedures used by the traffic law enforcement agency (α = 0.91)		4-item scale measuring support for the police (α = 0.86)
Hinds (2007)	4-item scale assessing perceived fairness of police decision-making procedures (α = 0.70)		6-item scale measuring the extent to which police are seen to have legitimate authority (α = 0.77)
Hinds and Murphy (2007)	3-item scale assessing general views about the way in which the police treat citizens with procedural justice (α = 0.70)		4-item scale measuring the extent to which police are seen to have legitimate authority (α = 0.75)
Huq et al., (2017)	4-item scale assessing the perceived frequency of local police interacting and making decision procedural fairly with citizens (α = NA)		Combined effects of two scales: a 3-item scale measuring felt moral duty to obey police authority (α = NA) and a 3-item scale measuring the degree of normative alignment with the police (α = NA)
Jackson et al. (2014)	4-item scale assessing perceived respectfulness, impartiality, and willingness to engage in dialogue of the police (α = NA)		Combined effects of two scales: a 3-item scale measuring felt obligation to obey the police (α = NA) and a 3-item scale measuring generalised trust in the police (α = NA)
Jackson et al., (2022a)	12-item scale assessing perceived police procedural justice (α = NA)		3-item scale measuring normative alignment and normative obligation to obey (α = NA)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Jackson et al. (2013)	4-item scale assessing trust in the procedural fairness of the police	Single-item scale assessing how important national identity is to their sense of self identity	4-item scale measuring perceptions of legitimacy of the police, in terms of felt obligation, moral alignment and perceived legality (α = NA)
Jackson et al., (2022b)	A scale assessing whether police officers in their neighbourhood being seen to generally treat people with respect and dignity, make neutral decisions, and allow citizens the chance to give their 'side of the story' (α = NA)		A scale measuring perceived normative alignment that police generally act in normatively appropriate ways (α = NA)
Jackson and Sunshine (2007)	4-item scale assessing perceived respectfulness, impartiality, and willingness to engage in dialogue of the police (α = NA)	Single-item scale assessing how much the respondents identified with their community (α = NA)	
Jeleniewski (2014) study 1	10-item scale assessing perceived procedural fairness of the police (α = 0.97)		10-item scale measuring perception of trust in and obligation to obey the police (α = 0.85)
Jeleniewski (2014) study 2	Combined effect of two manipulations in a vignette experiment: voice and impartiality		Combined effects of three scales: a 5-item scale measuring perception of trust in the police (α = 0.75), a 5-item scale measuring the perception of obligation to obey the police (α = 0.82), and a 5-item scale measuring the agreement on police's right to make rules (α = 0.83)
Johnson et al. (2014)	Combined effects of two scales: a 4-item scale assessing the quality of decision-making and a 6-item scale assessing the quality of treatment (α = NA)		Combined effects of three scales: a 5-item scale measuring institutional trust and a 5-item scale measuring obligation to obey (α = NA)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Jorgensen (2011)	6-item scale assessing general views about police procedural justice, such as respect, fairness, professionalism, and willingness to explain their action (α = 0.89)		4-item scale measuring perceived police legitimacy in terms of felt obligation to obey, trust, satisfaction, and trustworthiness (α = 0.80)
Karakus (2017)	3-item scale assessing perceived voice, respect, neutrality, and trustworthiness (α = 0.81)		6-item scale measuring respondents' level of trust in and satisfaction with neighbourhood police (α = 0.97)
Kim et al. (2019)	6-item scale assessing fairness of decision-making (α = 0.97)		6-item scale measuring trust in law enforcement (α = 0.94)
Kochel (2017)	3-item scale assessing perceived frequency of police violating procedural justice, such as illegitimate stop, using insulting language, and use of excessive force (α = 0.94)		4-item scale measuring obligation to obey directives from the police (α = 0.92)
Kochel (2018)	5-item scale assessing the level of agreement that police treat people respectfully, honestly, and fairly and take time to listen to and explain their action to people (α = NA)		3-item scale measuring perceived duty and moral obligation to obey police authority (α = NA)
Kruger et al. (2015)	4-item scale assessing perceived respect, trustworthiness, and voice (α = 0.94)		2-item scale measuring the willingness to obey and rely on the police (α = NA)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Kyprianides et al. (2021)	2-item scale assessing the level of agreement that the police explain their decisions to people and treat people with respect (α = NA)	Combined effects of two scales: a 3-item scale assessing the social identification with the police and aa 2-item scale assessing the superordinate identification (α = NA)	6-item scale measuring normative alignment and duty to obey the police (α = NA)
	3-item scale assessing perceived police procedural justice, such as treating people with respect (α = NA)	Combined effects of two scales: a 3-item scale assessing the relational identification with the police and a 2-item scale assessing the superordinate identification (α = NA)	6-item scale measuring normative alignment and duty to obey the police (α = NA)
Lawrence et al. (2021)	6-item scale assessing the perception that police officers treat citizens fairly and with integrity (α = 0.83)		5-item scale measuring the perception that citizens' basic rights are protected by the police (α = 0.63)
Lee and Lee (2021)	4-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.87)		Combined effects of two scales: a 3-item scale measuring the trustworthiness of the police (α = 0.84) and a 3-item scale measuring trust as participants' willingness to accept vulnerability to the police (α = 0.79)
Lee and Cho (2020)	3-item scale assessing normative judgements about police procedural justice (α = 0.95)		Combined effects of two scales: a 2-item scale measuring obligation to obey the police (α = 0.78) and a single-item scale measuring trust in police
Li (2018)	12-item scale assessing perceived participation, respect, neutrality, and benevolence (α = 0.97)		3-item scale measuring general trust in police (α = 0.90)
Lim and Kwak (2022)	5-item scale assessing perceived police procedural justice (α = 0.94)		5-item scale measuring public trust in police (α = 0.95)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Liu et al. (2020)	6-item scale assessing perceived police procedural fairness (α = 0.75)		4-item scale measuring perceived police trustworthiness (α = 0.80)
Liu and Nir (2021)	6-item scale assessing perceived police procedural justice (α = 0.82)		4-item scale measuring felt obligation to obey police (α = 0.76)
Lorenz (2017)	12-item scale assessing perceived voice, neutrality, respect, trustworthiness, motive-based trust, and procedural justice item specifically for sexual assault cases (α = 0.97)		Two-item scale measuring trust and confidence in the police (α = NA)
Lowrey et al. (2016)	Video footage depicts a traffic stop in which a police officer has stopped a driver for speeding with experimental conditions: procedural justice vs control		Combined effects of two scales: a 3-item scale measuring encounter-specific felt obligation to obey the police (α = NA) and a 3-item scale measuring encounter-specific trust and confidence in police (α = NA)
Lukic et al. (2016)	10-item scale assessing perceived police procedural justice, in terms of respect, voice, neutrality, and fairness (α = 0.93)		4-item scale measuring felt duty to obey police directives and perceived trustworthiness of police (α = 0.65)
Madon and Murphy (2021)	5-item scale assessing perceived voice, respect, neutrality, and fairness of police treatment (α = 0.87)		3-item scale measuring trust in police (α = 0.85)
Madon et al., (2017a)	10-item scale assessing voice, respect, neutrality, and trustworthiness in policing of terrorism (α = 0.95)	4-item scale assessing the strength of identity with Australia (α = 0.81)	8-item scale measuring perceived police legitimacy, in terms of trust and confidence in police, obligation to comply with police directives, and seeing police as morally aligned with one's values (α = 0.85)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Madon et al., (2017b)	7-item scale assessing perceived voice, respect, neutrality, and trustworthiness (α = 0.89)	A scale assessing feelings of belonging in society (α = 0.84)	4-item scale measuring public trust and confidence in police, feelings of obligation to obey police, and perceptions that police are morally aligned with the public (α = 0.77)
Madon et al. (2022)	Vignette manipulation of police officer treatment as procedural just condition vs procedural unjust condition		4-item scale measuring trust in police officer depicted in the scenario (α = 0.91)
McLean (2018)	7-item scale assessing situation-specific procedural justice regarding perceived quality of treatment and quality of decision-making process in the vignette		6-item scale measuring obligation to obey and trust in the police in the vignette
McLean and Nix (2021)	7-item scale assessing the perceptions of police officers' adherence to a fair process (α = NA),		Combined effects of three scales: a 3-item scale measuring trust in police (α = NA), a 3-item scale measuring felt obligation to obey the police (α = NA), and a 3-item scale measuring normative alignment (α = NA)
Mentovich et al. (2020)	5-item scale measuring perceived police fairness (α = 0.78)	3-item scale measuring identification with the state (α = 0.83)	5-item scale measuring felt obligation to obey police and normative alignment with the police (α = 0.87)
Muratbegovic et al. (2014)	12-item scale assessing the perception of police being respectful, polite, and fair when dealing with citizens (α = 0.93)		4-item scale measuring obligation to obey the police and trust in the police (α = 0.67)
Murphy (2013)	7-item scale assessing voice, respect, neutrality, and trustworthiness (α = 0.89)	4-item scale assessing the level of identification with Australian society (α = 0.75)	3-item scale measuring general trust and confidence in police (α = 0.81)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Murphy (2015)	3-item scale assessing perceived quality of treatment (youth: α = 0.61)		4-item scale measuring feelings of confidence in the police and obligation to obey the police (youth: α = 0.74)
Murphy and Cherney (2011)	6-item scale assessing the perceived quality of treatment and quality of decision-making of the police (α = 0.87)	4-item scale assessing the level of identification with Australia as the superordinate group (α = 0.78)	5-item scale measuring felt respect and confidence in the police (α = 0.92)
Murphy et al. (2022)	9-item scale assessing immigrants' general perceptions of the police as procedurally just in their interactions with the public (α = .NA)	4-item scale assessing the strength of identification with police (α = .NA)	
Murphy and Cherney (2018)	5-item scale assessing the general perception of experiencing fair treatment from police in their local community (α = 0.86)	5-item scale assessing the level of attachment and feelings of belonging in their local community (α = 0.76)	2-item scale measuring felt trust and confidence in the police (α = 0.89)
Murphy et al. (2008)	3-item scale assessing general views about the way in which police generally make their decisions and treat citizens (study 1: α = 0.70; study 2 time 1: α = 0.87; study 2 time 2: α = 0.54)		4-item scale measuring the extent to which police are seen to have legitimate authority (study 1: α = 0.88; study 2 time 1: α = 0.84; study 2 time 2: α = 0.85)
Murphy et al. (2015)	5-item scale assessing general perceptions of the quality of treatment and the quality of decision-making by police (α = 0.86)	Single-item scale measuring superordinate identity as the level of agreement of seeing themselves first and mainly as a member of the Australian community	
Nalla and Nam (2021)	4-item scale assessing perceived politeness and fairness of police (α = 0.82)		2-item scale measuring trust in police (α = 0.66)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Nix et al. (2015)	4-item scale assessing perceived respect, fairness, willingness to listen to and explain their actions to the people from the police (α = 0.94)		Single-item scale measuring trust in the police
Nam et al. (2022)	4-item scale assessing perceived respect, fairness, willingness to listen to and explain their actions to the people from the police (study 1: α = 0.94; study 2: α = NA)		3-item scale measuring obligation to obey and trust in police (study 1: α = 0.68; study 2: α = 0.69)
Nuno (2017)	4-item scale assessing perceived respect, fairness, and willingness to listen to the people from the police (AZCVS: α = 0.90; AARIN: α = 0.91)		2-item scale measuring felt obligation to obey police (AZCVS: α = 0.68; AARIN: α = 0.69)
Paek et al. (2019)	7-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.92)		Combined effects of three scales: a 3-item scale measuring felt obligation to obey the police (α = 0.63), a 4-item scale measuring trust in police (α = 0.90), and a 4-item scale measuring normative alignment (α = 0.77)
Peacock (2018)	8-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.92)		5-item scale measuring felt obligation to obey and perceived trustworthiness of the police
Pearce et al. (2020)	3-item scale assessing perceived fairness of police rules and procedures, perceived opportunities to correct unfair decisions, and whether police decisions were thought to be based on facts rather than personal opinions	2-item scale measuring the extent to which participants considered the police to represent the interests and values of their community	

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Pehrson et al. (2017)	15-item scale assessing perceived general perception of respect, fair decision-making, and distributive fairness from police (α = 0.92)	10-item scale measuring identification with wider society in terms of solidarity, satisfaction, and centrality (α = 0.91	4-item scale measuring felt obligation to obey the police (α = 0.73)
Perry et al. (2017)	Combined effects of two scales: a 5-item scale assessing perceived participation and respect in police treatment (α = 0.83) and a 4-item scale assessing perceived neutrality of the police (α = 0.67)		6-item scale measuring trust in the police (α = 0.80)
Piccirillo et al. (2021)	4-item scale assessing perceived respect, fairness, and willingness to listen and explain to people from the police (α = 0.84)		6-item scale measuring perceived normative alignment with the police and felt obligation to obey the police (α = 0.77)
Pina-Sanchez and Brunton-Smith (2020)	19-item scale assessing perceptions of fairness and equity (α = 0.74)		11-item scale measuring perception of legitimacy of criminal justice agencies (α = 0.80)
Pryce (2014)	8-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.84)		Combined effects of two scales: a 4-item scale measuring felt obligation to obey the directives of the police (α = 0.84) and a 4-item scale measuring trust in the institution of policing (α = 0.88)
Pryce and Grant (2020)	6-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.90)		4-item scale measuring felt obligation to obey the police (α = 0.80)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Radburn et al. (2018)	3-item scale assessing whether the police treat protestors with respect and fairness (α = 0.83)	3-item measures of relational identification with the police (α = 0.96)	4-item scale measuring a felt obligation to obey the police (α = 0.90)
	4-item scale assessing whether the police treat protestors with respect and fairness (α = 0.85)	3-item measures of relational identification with the police (α = 0.95)	4-item scale measuring a felt obligation to obey the police (α = 0.76)
Reisig et al. (2007)	10-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.90)		8-item scale measuring a felt obligation to obey the police and trust in police (α = 0.72)
Reisig et al. (2021)	5-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.90)		3-item scale measuring obligation to obey the police (α = 0.77)
Reisig and Lloyd (2009)	6-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.71)		2-item scale measuring the sense of obligation to obey the police (α = NA)
Reisig et al. (2014)	6-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.78)		4-item scale measuring a felt obligation to obey the police and trust in police (α = 0.63)
Rengifo and Slocum (2020)	Combined effects of two dichotomous variables that capture whether respondents perceived that they were treated with disrespect and whether they were dissatisfied with how the officers handled the encounter		3-item scale measuring perceived local judgements about the specific form of authority exerted by the police (α = 0.64)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Rodrigues and Medina (2021)	Dichotomous measure was used in the first wave survey while 4-item scale assessing perceived willingness to listen and explain their actions, politeness, and consistency of the police (α = 0.86)		Dichotomous measure was used in the first wave survey while a 3-item scale measuring trust, normative alignment, obligation to obey, and the belief that the police have the authority to act was used in the second and third wave surveys (α = 0.61)
Sargeant et al. (2022)	5-item scale assessing perceived fair treatment and fair decision-making when police were 'issuing fines to people flouting social distancing rules' during the pandemic (α = NA)		4-item scale measuring trust and confidence in police and moral alignment with police (α = NA)
Saulnier and Sivasubramaniam (2021)	Combined effects of four scales: a 6-item scale assessing respect and neutrality of treatment (α = 0.93), a 3-item scale assessing perceived trust in the procedure used to administer the surveillance (α = 0.93), a 4-item scale assessing authority trust as the extent to which the authority administering the surveillance procedure is evaluated as trusting the subordinate (α = 0.89), and a 3-item scale assessing voice as the extent to which the traveller had input during the interaction (α = 0.79)	Group membership was manipulated by varying the description of the traveller's relationship to the nation-state in the vignette dichotomously into in-group and out-group	
Silver (2020)	Vignette describing a hypothetical use-of-force incident in which the procedural justice used by the officer is manipulated		2-item scale measuring felt trust and obligation to obey to police

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Solomon (2018)	Combined effects of two procedural justice manipulations in video vignettes simulating traffic stops: treatment quality and decision-making quality		Combined effects of two scales: a 4-item scale measuring encounter-specific perceptions of obligation to obey police (α = 0.97) and a 3-item scale measuring encounter-specific perceptions of trust and confidence in police (α = 0.96)
Solomon and Chenane (2021)	Combined effects of two procedural justice manipulations in video vignettes simulating traffic stops: treatment quality and decision-making quality		Combined effects of two scales: a 4-item scale measuring encounter-specific perceptions of obligation to obey police (α = 0.96) and a 3-item scale measuring encounter-specific perceptions of trust and confidence in police (α = 0.96)
Sun et al. (2017)	5-item scale assessing perceived procedural justice of police (α = 0.90)		4-item scale measuring felt obligation to obey to police directives (α = 0.83)
Sunshine and Tyler (2003b)	2-item scale assessing how often the respondents perceive the police to make decisions and treat people fairly (α = 0.91)	6-item scale measuring the perceived level of connection to their community (α = 0.93)	7-item scale measuring the level of agreement on the belief that the values and tenets of law enforcement authorities are consistent with respondents' personal beliefs about right and wrong (α = 0.87)
Sunshine and Tyler (2003a)	11-item scale assessing the perceived fairness of decision-making and fairness of treatment of police in their neighbourhood (α = 0.91)		19-item scale measuring the perceived obligation to obey the directives of a legal authority and trust in the institution of policing (α = 0.84)
Tankebe (2009)	19-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.90)		Combined effects of two scales: a 6-item scale measuring perceived trustworthiness of the police (α = 0.80) and a 7-item scale measuring perceived obligation to obey police (α = 0.60)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Tankebe and Asif (2016)	Combined effects of two scales: a 3-item scale assessing perceived quality of interpersonal (α = 0.71) and a 6-item scale assessing perceived quality of decision-making (α = 0.75)		4-item scale measuring the perceived obligation to obey directives of police (α = 0.66)
Trinkner and Cohn (2014)	10-item scale assessing perceived fairness of treatment and decision-making of police in neighbourhood (α = 0.97)		10-item scale measuring perceived trust in and obligation to obey police (α = 0.78)
Trinkner et al. (2019)	Combined effects of two procedural justice manipulations: voice and impartiality		10-item scale measuring scenario-specific perception of trust in and obligation to obey police (α = 0.91)
Trinkner et al., (2020)	4-item scale assessing the perception that a police officer would be procedurally fair if the officer thought they did something wrong (α = 0.75)		5-item scale measuring the perception that police are an appropriate legal authority entitled to obedience (α = 0.71)
Tsushima and Hamai (2015)	3-item scale assessing perceived police fairness in terms of treating people with respect, making fair and impartial decisions, and explaining their decisions and actions to people (α = 0.85)		Combined effects of two scales: a 3-item scale measuring perceived duty towards the police (α = 0.87) and a 3-item scale measuring perceived moral alignment with police (α = 0.81)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Tyler (2005)	Combined effects of three constructs measured by five scales: regarding the quality of decision-making, a 4-item scale assessing the neutrality of police decision-making (α = 0.81) and a 4-item scale assessing perceived extent of racial harassment of the police (α = 0.88); regarding the quality of treatment, a 2-item scale assessing the quality of general interpersonal treatment by the police (α = 0.80) and a 5-item scale assessing perceived extent of racial profiling (α = 0.88), and a 2-item scale assessing perceived opportunities for input into police decisions		Combined effects of two scales: an 8-item scale measuring institutional trust (α = 0.82) and a 3-item scale measuring the perceived motive-based trust in police (α = 0.84)
Tyler and Jackson (2014)	Combined effects of two scales: a 4-item scale assessing perceived quality of decision-making (α = 0.84) and a 5-item scale assessing perceived quality of interpersonal treatment (α = 0.94)	7-item scale measuring perceived identification with the community that the respondents live in (α = 0.89)	Combined effects of three scales: a 4-item scale measuring perceived obligation towards police (α = 0.82), a 5-item scale measuring perceived trust in the police (α = 0.87), and a 6-item scale measuring perceived normative alignment with the police (α = 0.92)
Tyler et al. (2010)	Combined effects of three scales: a 2-item scale assessing perceived overall procedural justice in policy implementation (α = 0.73), a 5-item scale assessing perceived fairness of police decision-making, and a 5-item scale assessing perceived police quality of treatment (α = 0.75)	4-item scale measuring perceived strength of identification with America (α = 0.86)	8-item scale measuring the degree to which the respondents felt an obligation to obey the law and felt trust and confidence in legal authorities (α = 0.61)

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Van Damme (2017)	5-item scale assessing perceived trust in procedural justice (α = 0.86)		Combined effects of two scales: a 3-item scale measuring perceived moral alignment with the police (α = 0.75) and a 3-item scale measuring felt obligation to obey police (α = 0.73)
Van Damme and Pauwels (2016)	8-item scale assessing perceived quality of treatment and quality of decision-making (α = 0.83)		Combined effects of two scales: a 3-item scale measuring perceived moral alignment with the police (α = 0.81) and a 4-item scale measuring felt obligation to obey police (α = 0.79)
Van Petegem et al. (2021) study 1	11-item scale assessing general perceptions of police procedural justice (α = 0.84)		4-item scale measuring felt obligation to obey police (α = 0.87)
Ward (2022)	4-item scale assessing perceived quality of police processes with respect to police treatment and decision-making (α = NA)		2-item scale measuring the belief that the police ought to be allowed to issue orders and expect compliance (α = NA)
Watson et al. (2021)	T3-item scale assessing the extent to which respondents believed that police officers engage in procedurally just conducts when interacting with citizens (α = 0.82)		Single-item scale measuring trust in the police
Wolfe and McLean (2021)	Vignette describing an incident in which the officer issue a speeding ticket with manipulation of procedural justice	7-item scale measuring perceived affirmation of American identity (α = 0.95)	6-item scale measuring obligation to obey police and trust and confidence in police (α = 0.87)
Wolfe et al. (2016)	4-item scale assessing the level of agreement that police in their neighbourhoods treat people with respect and fairness, listen to people, and explain their decisions (α = 0.94)		Combined effects of two scales: a 2-item scale measuring felt obligation to obey police (α = 0.68) and a single-item scale measuring perceived trust in police

Table 5 (continued)

Study	Procedural justice	Social identity	Legitimacy
Woo et al. (2018)	6-item scale assessing the perceptions of the extent to which police treat people respectfully and humanely and rely on fair decision-making procedures (α = NA)		2-item scale measuring felt obligation to obey directives of police (α = NA)
Wu and Miethe (2022)	6-item scale assessing perceptions of local police conducts such as treating citizens with dignity and respect and providing the same quality of service to all citizens (α = 0.95)		5-item scale measuring perception of police such as trust in police, obligation to obey police, and normative alignment with police (α = 0.89)
Zahnow et al. (2021)	7-item scale assessing perceived police procedural justice (α = 0.90)		Combined effects of two scales: a 2-item scale measuring felt obligation to obey police (α = 0.91) and a 3-item scale measuring perceived trust in police (α = 0.70)
European Social Survey European Research Infrastructure (2018)	3-item scale assessing the perceptions of police in treating people with respect, making fair and impartial decisions, and explaining their decisions and actions when asked to do so (α = 0.62–0.80)		6-item scale measuring felt obligation to obey police and perceived normative alignment with police (α = 0.39—0.69)
MacQueen and Bradford (2013)	Manipulation of police treatment in either test condition (procedural justice) or control condition	4-item scale measuring the level of identification with the Scottish community and as a law-abiding citizen (α = 0.78)	2-item scale measuring encounter-specific perceived trust and confidence in police (α = 0.49)
Antrobus et al., (2015)	Manipulation of police treatment in either test condition (procedural justice) or control condition	4-item scale measuring perceived strength of ties and identification with their local neighbourhood (α = 0.68)	2-item scale measuring encounter-specific perceived trust and confidence in police (α = 0.87)

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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