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Procedural justice perceptions, legitimacy beliefs, and compliance with the law: a meta-analysis

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Abstract

Objectives The purpose of this study was to compare procedural justice and legitimacy as correlates and predictors of compliance with the law.

Methods A literature review produced 64 studies, 95 samples, and 196 effect sizes from studies published or conducted sometime between 1990 and February 2018 in which procedural justice was correlated with legitimacy and/or compliance, or legitimacy was correlated with compliance. Fifty samples included all 3 correlations, 3 samples included 2 correlations, and the remaining 42 samples included a single correlation. Two random effects meta-analyses were performed.

Results Pooled univariate effects for all three correlations achieved significance. Although there was a high degree of heterogeneity in the results and modest evidence of publication bias in one of the subsamples, sensitivity testing indicated that no one study had an undue influence over the results. Using a generalized least squares (GLS) multivariate approach, a path analysis revealed a significant a path from procedural justice to legitimacy, a significant b path from legitimacy to compliance, and a significant c' path from procedural justice to compliance, but only the a and b paths were significant when the analysis was restricted to studies with longitudinal data.

Conclusions The current findings suggest that legitimacy beliefs are instrumental in promoting compliance with the law and that while procedural justice perceptions also appear to predict compliance, the effect was relatively weak in this meta-analysis and could not be reliably established in longitudinal datasets.

Keywords Procedural justice · Legitimacy beliefs · Compliance with the law · Meta-analysis

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Procedural justice is the perception that the police, courts, and other agents of social control routinely enforce and administer the law in a just and equitable manner. Citizens who perceive that they have been treated with respect and fairness by the police and courts should be more cooperative and compliant with the law and its various agents than those who perceive they have not been treated with respect and fairness (Tyler 2001b). In testing this assumption, researchers have found that people with favorable procedural justice perceptions are more likely to cooperate with the authorities and comply with the law than people with negative procedural justice perceptions (Fagan and Tyler 2005; Murphy and Gaylor 2010; Reisig and Mesko 2009; Sunshine and Tyler 2003). Perceiving fair and just treatment under the law is central to procedural justice theory but the full theory is more nuanced. Take, for instance, the related construct of legitimacy. Legitimacy is the belief that the police, courts, and other agents of legal authority have the moral right to enforce and administer the law and that people have an obligation and responsibility to obey the law. Citizens with strong legitimacy beliefs recognize and respect the legal authority of the police and courts and are willing to cooperate with these agents of social control and comply with the law (Tyler 2006). As with procedural justice, there is evidence that people who endorse strong legitimacy beliefs are more apt to cooperate with legal authorities and comply with the law than people holding weak legitimacy beliefs (Reisig and Lloyd 2009; Tyler and Fagan 2008; White et al. 2016).

Literature review

Procedural justice and legitimacy have been found to correlate moderately (Hinds and Murphy 2007; Reisig et al. 2007; Sunshine and Tyler 2003), which should come as no surprise given that these two variables were originally conceived as interconnected concepts. According to Tyler's (1990, 2003) process-based model of self-regulation, cooperation with legal authorities and compliance with society's laws is contingent on experiencing procedural justice in one's interactions with legal authorities and recognizing the moral legitimacy of these authorities to perform their duties. The process begins with strong perceptions of procedural justice, leading to high legitimacy beliefs and the formation of self-regulation skills, and ends with greater willingness on the part of the individual to cooperate with the authorities and abide by the law (Sunshine and Tyler 2003). In this model, legitimacy is assumed to mediate the relationship between procedural justice and cooperation/compliance. One concern, however, is that mediation studies using prospective data on juvenile and young adult offenders have failed to generate clear support for the notion that legitimacy mediates the procedural justice–compliance relationship (Penner et al. 2014; Walters 2018). What is more, the results of several other studies suggest that the effect of procedural justice on compliance and cooperation may be more properly ascribed to legitimacy (Fagan and Piquero 2007; Levi et al. 2009; Tyler et al. 2007). This is an issue that requires clarification.

Although procedural justice and legitimacy are believed to predict both compliance and cooperation (Tyler 1990), the focus of the current investigation was on compliance. Tyler (1990) originally proposed that procedural justice leads to legitimacy, which, in turn, leads to compliance, yet it is also possible that procedural justice follows a direct path to compliance. Walters (2018) examined the relationship between procedural justice

perceptions, legitimacy beliefs, and subsequent offending in a large sample of 18-year-old males with extensive histories of delinquency, and determined that legitimacy, not procedural justice, predicted future offending. He further noted that legitimacy beliefs at age 18 predicted procedural justice perceptions at age 19, whereas procedural justice perceptions at age 18 did not predict legitimacy beliefs at age 19, that legitimacy beliefs were significantly more stable than procedural justice perceptions, and that moral engagement mediated the relationship between legitimacy beliefs and future offending. Examining the item content of the legitimacy scale, Walters (2018) surmised that the legitimacy scale may be the polar opposite of negative attitudes toward authority, one of the three dimensions of criminal thought content proposed by Walters and colleagues (Walters 2016; Walters and Morgan 2018). If legitimacy beliefs are, in fact, the flip side of negative attitudes toward authority then it would make sense for these relatively stable features of thought content to do a better job of predicting compliance with the law than a more situationally specific variable like perceptions of procedural justice.

The body of research on procedural justice, legitimacy, and compliance has progressed on several fronts, but there is still a need for greater synthesis of results. First, most of the early research conducted on procedural justice and legitimacy was carried out in the USA (Reisig et al. 2014). Questions have accordingly been raised as to the applicability of this research to other geographical regions (Hough et al. 2010). In recent years, there has been a noticeable increase in the number of studies on procedural justice and legitimacy conducted outside of North America (Van Damme and Pauwels 2016). Second, the majority of studies in this area have focused on procedural justice and legitimacy as applied to law enforcement. Even so, people's procedural justice perceptions of and legitimacy beliefs about other aspects of the criminal justice system, such as the courts and corrections, may be just as important as their perceptions of and attitudes toward the police. Third, compliance can be measured in several different ways, the two most prominent being people's law abiding behavior and their intention to lead a law abiding life. There is a need, then, to determine whether the relationships between procedural justice, legitimacy, and compliance differ as a function of how compliance is measured. Fourth, most of the studies in this area have analyzed cross-sectional data, although a few longitudinal studies have been performed. It would be helpful to know whether relationships observed with cross-sectional data parallel those observed with prospective data.

Mazerolle et al. (2013) systematically reviewed empirical research on the effects of intervention programs designed to improve police legitimacy by focusing on procedurally just dialog and four different outcomes. Conducting four separate analyses, Mazerolle et al. (2013) determined that police-led interventions improved perceptions of procedural justice, satisfaction with and confidence in the police, and compliance and cooperation with the authorities, but they did nothing to enhance legitimacy beliefs toward law enforcement. This illustrates the valuable contributions meta-analyses can make to the study of relationships involving procedural justice and legitimacy. The meta-analytic technique may be just as useful in investigating the relationship between perceptions of procedural justice, legitimacy beliefs, and cooperation/compliance as it was in assessing the effect of police-led program initiatives designed to improve legitimacy. The outcome selected for this meta-analysis was compliance, rather than the cooperation/compliance composite examined by Mazerolle et al. (2013), and the predictors or correlates were procedural justice and legitimacy.

Present study

The research question addressed in this meta-analysis was predicated on the belief that procedural justice perceptions and legitimacy beliefs are equally important in promoting compliance with the law yet play different roles in the compliance process. This is consistent with Tyler's (2003, 2006) views on the individual contributions of procedural justice and legitimacy to law compliance. Whereas situationally specific procedural justice perceptions initiate the process, the more temporally stable legitimacy beliefs may provide a better link to compliance. Although Tyler has never actually come out and stated that legitimacy beliefs mediate the relationship between procedural justice and compliance, he has asserted that "…the roots of legitimacy lie in people's assessment of the fairness of the decision-making procedures used by authorities and institutions" (Tyler 2001a, p. 416). Hence, it is the fairness of the procedure rather than the favorableness of the outcome that is most important in shaping people's legitimacy beliefs (Tyler 1997). The progression from procedural justice to legitimacy to compliance insinuates mediation of the procedural justice–compliance relationship by legitimacy, a mediated relationship made specific by Murphy and others (Murphy 2005; Murphy et al. 2016).

Procedural justice, as defined by Tyler (1990), is the perceived fairness of decision-making procedures and the perceived treatment the individual receives at the hands of the decision-maker. The degree to which the decision-maker is viewed as fair, respectful, and impartial, all features of procedural justice, enhances the perceiver's belief in the legitimacy of the decision-making authority or institution (Tyler 1997). Enhanced legitimacy means that the decision-maker is viewed as competent and deserving of respect and obedience (Black 2008). Obedience to competence, more so than fear of punishment, is what eventually encourages compliance with the law, according to Tyler (2003). The value of this model and the reason for conducting this study was to identify the optimal pathway to compliance. Armed with this knowledge, community and training programs can be made more effective as a means of promoting law abiding behavior in citizens. It was hypothesized that while procedural justice, like legitimacy, would correlate with compliance, the indirect effect of procedural justice on compliance via legitimacy would prove superior to the direct effect of procedural justice on compliance, particularly when longitudinal data were analyzed. A structural equation path analysis was consequently performed in an effort to test this hypothesis.

Method

Selection criteria

Five criteria were used to select studies for this meta-analysis. First, the studies had to have been completed or published by February 2018 and no earlier than 1990, the year Tyler (1990) published the first edition of his influential book introducing the concepts of procedural justice and institutional legitimacy. Second, studies needed to include measures of at least two of the three variables examined as part of this meta-analysis—procedural justice, legitimacy, and compliance. Third, formal legal authorities (e.g., police, courts, corrections, tax office) had to be the focus of the procedural justice and

legitimacy measures. Fourth, compliance with the law must have been assessed either behaviorally (e.g., recent involvement in offending) or through intentions (e.g., response to a criminal scenario or future intentions to violate or comply with the law). Fifth, zero-order correlations between the measures of procedural justice, legitimacy, and compliance had to either be available in the original article or provided by the researchers upon request.

Studies

A literature search was conducted in an attempt to collect every published study and as many unpublished studies as possible with information on perceptions of procedural justice, compliance with the law, and/or beliefs about the legitimacy of the criminal justice system. Databases included in this search followed the procedures adopted in several previous criminal-justice-related meta-analyses (Bolger 2015; Bolger and Lytle 2018; Kochel et al. 2011, Lytle 2014; Mitchell 2005). The specific databases accessed were ABC-CLIO Social Studies Databases, Academic Search Complete, Criminal Justice Abstracts, Dissertation Abstracts, EconLit, Emerald Insight, Hein, JSTOR Journals, PsycArticles, Psychology and Behavior Sciences Collection, PsycINFO, Social Sciences Citation Index, SocIndex, and Sociological Collection. These databases were searched using the following key words in the abstracts of articles: (procedural justice) AND/OR (legitimacy) AND/OR (compliance OR arrest OR conviction OR intent OR crime OR offending). These search procedures produced an original population of 1,549,853 studies and articles.

The database search was restricted to academic journal articles, books, conference proceedings, and dissertations/theses in order to eliminate results from non-peer-reviewed sources, such as periodicals, and articles not available in an English language format. By restricting the initial search to these sources, a sample of 3665 studies was identified. The abstracts and, in some cases, the method sections of these 3665 papers were then reviewed and papers not meeting the criteria outlined in the previous section were discarded. This produced a sample of 101 papers, approximately half of which were eventually eliminated because they were qualitative, included samples that overlapped with another study, or did not meet the selection criteria outlined above. Additional studies were identified by reviewing the reference sections of prior papers on procedural justice and/or legitimacy. This procedure produced 70 studies/reports, 20 of which failed to include analyzable effect size data. The authors of these 20 studies were contacted by e-mail for the necessary information and authors who did not respond to the initial e-mail were re-contacted at least two more times. Fourteen of the authors (70%) responded to these requests, resulting in a 64 study, 95 sample, 196 effect size meta-analysis.

Measures

The procedural justice, legitimacy, and compliance measures used in each of the 64 studies are described in Table 5. Procedural justice was defined as perceptions of fairness, respect, neutrality, and the right to participate in the legal process, whereas legitimacy was defined as a belief in one's obligation to obey the law and a general sense of trust in the legal system and its principal agents (e.g., police officers, court

officials). These definitions were fairly consistent across the 64 studies and conformed to Tyler's (2003, 2006; Sunshine and Tyler 2003) process-based model. In each of the 64 studies, procedural justice and legitimacy were ordinarily evaluated using Likert-type rating scales. Measures of compliance were less uniform and were subclassified as behavioral or intentional.

Effect sizes were computed as Pearson product-moment correlations, although in three instances (Beijersbergen et al. 2016; Elliott et al. 2011; White et al. 2016), point-biserial correlations were calculated because of a dichotomous compliance measure. Outcomes from the one study reporting multiple outcomes (i.e., White et al. 2016) were averaged before being submitted to meta-analysis.

Procedure

The univariate portion of this meta-analysis was performed with comprehensive meta-analysis, Version 2 (CMA; Borenstein et al. 2005) and a random effects model was employed based on the assumption that the effect sizes for the different studies likely varied as a function of certain features of the sample or outcome. Additional analyses were conducted to assess for heterogeneity, the possibility of publication bias, and sensitivity. Heterogeneity was assessed with the Q-statistic and I^2 (Higgins and Thompson 2002) and publication bias was judged against funnel plots (Egge et al. 1997) and Duval and Tweedie's (2000) trim and fill procedure. Sensitivity was tested by re-computing the pooled effect size for total sample and longitudinal study procedural justice–legitimacy, legitimacy–compliance, and procedural justice–compliance correlations after each individual effect size had been systematically removed, one at a time, from the sample and the pooled effect size recalculated.

Results were also subjected to multivariate path analysis using a modified general least squares (GLS) estimation approach developed by Becker and colleagues (Becker 1992, 1995, 2000; Becker and Schram 1994). The modified GLS approach consists of two steps. In the first step, correlation coefficients are synthesized across studies using either a univariate or multivariate strategy. Univariate procedures weight each study by its sampling variance, whereas multivariate procedures entail calculating partial slopes to account for the dependence of correlation coefficients. In the present study, univariate methods were employed with studies examining the a path of the path analysis (from procedural justice to legitimacy) and multivariate methods were employed with studies examining the b (from legitimacy to compliance) and c' (direct effect from procedural justice to compliance, conditioning on legitimacy) paths of the path analysis. The second step of the modified GLS procedure is to examine the pooled correlation matrix and asymptotic covariance from the first step of the procedure with structural equation modeling (Zhang 2011). A random effects model was employed with the modified GLS method and covariances were computed using sample mean correlations across studies (Becker and Schram 1994).

Two continuous and four categorical variables were included in this study as possible moderator variables. The two continuous moderator variables were mean age and proportion of females. The first categorical variable was study location (North America versus Europe versus other parts of the world). The second moderator variable considered whether the focus of the procedural justice and legitimacy measures was exclusively on the police or whether there was a mixed criminal justice (police and/or courts, corrections, judges) focus. The third moderator variable considered whether a

behavioral (e.g., past offending, previous arrests) or intentional (e.g., future intention to commit or response to hypothetical crime scenario) measure of compliance was employed. The fourth and final moderator variable was based on the research design (cross-sectional versus longitudinal).

Reasonably good reliability was obtained when the current authors independently rated each individual study on the four categorical moderator variables employed in this meta-analysis: location (97.8% agreement, $\kappa = .97$), police focus (87.9% agreement, $\kappa = .76$), compliance (90.7% agreement, $\kappa = .61$), and design (89.4% agreement, $\kappa = .57$). Discrepancies were resolved with discussion and derivation of a consensus rating by the authors. The two continuous moderator variables were assessed with the CMA meta-regression approach, location was assessed with the Q-between (Q_b) statistic, and the other three categorical moderator variables were assessed with the univariate (a path) or multivariate (b and c' paths) modified GLS procedure.

Results

Table 1 provides a synopsis of the 64 studies and 95 samples used in the present meta-analysis. Pooling the 196 non-redundant univariate effect sizes from this meta-analysis with a random effects model produced mean effect sizes of .47, .14, and .10 for the procedural justice–legitimacy, legitimacy–compliance, and procedural justice–compliance univariate relationships, respectively (see Table 2). There was strong evidence of heterogeneity (Q statistic and I^2) across all three relationships and modest evidence of publication bias in the legitimacy–compliance (longitudinal studies) relationship (see funnel plot in Fig. 1 and trim and fill procedure in Table 2). Sensitivity testing revealed that no one study had an undue influence over the overall pattern of results.

The path analysis results are summarized in Table 3. As previously stated, these analyses were performed using the modified GLS method and a random effects model. Results for the total sample paralleled those from the univariate analyses and were fairly uniform regardless of whether samples and studies with missing data (handled with a factored likelihood method that uses a series of regressions to adjust for the effect of missing variables) were included or left out. When the analyses were restricted to samples from studies employing a longitudinal design, the results no longer supported the c' path from procedural justice to compliance, despite the fact the a (from procedural justice to legitimacy) and b (from legitimacy to compliance) paths remained significant. Revisiting Table 2, we note that the c path between procedural justice and compliance, without conditioning on legitimacy, achieved only a small total effect.

The results of analyses conducted on the two continuous (age and percent female) and four categorical (location, police, compliance, and design) moderating variables are summarized in Table 4. Although there was minimal evidence of age or gender moderation in these results, younger samples did record significantly higher univariate results on the b path (legitimacy and compliance). This suggests that younger individuals may be more compliant in the face of increased legitimacy than older individuals. Analyses performed on the categorical moderators revealed that cross-sectional studies and studies focused on the police produced higher procedural justice and legitimacy coefficients (a path); longitudinal studies, studies from North America, and studies focused on the police produced higher legitimacy and compliance coefficients (b path);

Table 1 Studies included in the current meta-analysis

Study	Sample	Age	%F	Location	PJ	Legit	Compliance	Design	P-C	L-C	P-L
Akinlabi (2017)	305 HS students	15.1	.44	Nigeria	P	P	Behavior	C	−.06	.15	.14
Akinlabi and Murphy (2018)	600 adults	32.7	.51	Nigeria	P	P	Intentions	C	.40	.07	.07
Baker (2017)	311 inmates	30.8	.00	US	C	L		C			.32
Baker et al. (2015)	814 inmates	34.7	1.00	US	C	L		C			.14
Beijersbergen et al. (2016)	1169 prisoners	30.5	.00	Netherlands	R	R	Behavior	L	.06	.11	.21
Bradford et al. (2015)	816 adult drivers	50.7	.37	Scotland	P	P	Intentions	C	.27	.35	.64
Canada and Hiday (2014)	80 MH clients	39.6	.45	US	R		Behavior	L	−.19		
Chui and Cheng (2015)	1157 youth	17.0	.47	China	W	Y		C			.34
Czapska et al. (2016)	506 college students	22.2	.64	Poland	P	P	Intentions	C	.08	.17	.56
D'hondt (2013)	447 college students	22.2	.71	Belgium	J	J	Intentions	C	.34	.38	.54
Elliott et al. (2011)	110 adults	39.8	.53	Australia	P	PL	Behavior	C	.22	.43	.53
European Social Survey (2010)	1704 adults	46.8	.52	Belgium	P	PL	Behavior	C	.06	.08	.40
	2430 adults	50.7	.55	Bulgaria	P	PL	Behavior	C	.09	.01	.47
	1618 adults	47.0	.54	Croatia	P	PL	Behavior	C	.05	.05	.42
	1077 adults	48.5	.55	Cyprus	P	PL	Behavior	C	.09	.05	.53
	2386 adults	44.0	.49	Czech Rep	P	PL	Behavior	C	.10	.11	.36
	1576 adults	48.5	.49	Denmark	P	PL	Behavior	C	.07	.15	.41
	1793 adults	48.7	.60	Estonia	P	PL	Behavior	C	.05	.08	.39
	1878 adults	48.8	.52	Finland	P	PL	Behavior	C	.04	.04	.43
	1728 adults	47.6	.52	France	P	PL	Behavior	C	.10	.09	.43
	3026 adults	47.0	.48	Germany	P	PL	Behavior	C	.10	.09	.36
	2714 adults	46.1	.56	Greece	P	PL	Behavior	C	.07	.09	.56
	1561 adults	47.6	.54	Hungary	P	PL	Behavior	C	.03	.07	.41

Table 1 (continued)

Study	Sample	Age	%F	Location	PJ	Legit	Compliance	Design	P-C	L-C	P-L
	2576 adults	43.1	.54	Ireland	P	PL	Behavior	C	.12	.17	.50
	2268 adults	45.5	.54	Israel	P	PL	Behavior	C	.05	.06	.45
	1641 adults	48.1	.66	Lithuania	P	PL	Behavior	C	.12	.14	.45
	1829 adults	48.2	.53	Netherlands	P	PL	Behavior	C	.06	.05	.37
	1549 adults	46.3	.50	Norway	P	PL	Behavior	C	.13	.14	.48
	1751 adults	44.4	.52	Poland	P	PL	Behavior	C	.11	.08	.39
	2150 adults	51.8	.60	Portugal	P	PL	Behavior	C	.01	.04	.32
	2595 adults	44.0	.58	Russia	P	PL	Behavior	C	.04	.04	.50
	1849 adults	47.5	.57	Slovakia	P	PL	Behavior	C	.05	.05	.31
	1385 adults	47.4	.54	Slovenia	P	PL	Behavior	C	.04	.06	.37
	1880 adults	46.1	.52	Spain	P	PL	Behavior	C	.15	.17	.44
	1497 adults	48.6	.52	Sweden	P	PL	Behavior	C	.08	.10	.43
	1502 adults	47.8	.49	Switzerland	P	PL	Behavior	C	.12	.08	.30
	2415 adults	47.3	.55	UK	P	PL	Behavior	C	.09	.08	.44
	1931 adults	46.3	.63	Ukraine	P	PL	Behavior	C	−.07	−.01	.42
Ferdik et al. (2014)	296 college students	22.3	.58	US	P	P		C			.44
Fine et al. (2017)	1216 youth	15.3	.00	US		PL	Behavior	L		.16	
Fine et al. (2018)	128 adults	35.4	.46	US	L	L	Intentions	C	−.02	.18	.64
Fontaine et al. (2016)	1037 children	14.0	.00	Canada		PL	Behavior	L		.32	
Gau et al.(2012)	531 adults	54.9	.67	US	P	P		C			.74
Gobena and Van Dijke (2017)	217 taxpayers	36.3	.14	Ethiopia	T	T	Behavior	C	.17		
	200 taxpayers	37.9	.44	US	T	T	Behavior	C	.36		
Harvell (2008)	46 youth	15.8	.11	US	PL	PL		C			.14

Table 1 (continued)

Study	Sample	Age	%F	Location	PJ	Legit	Compliance	Design	P-C	L-C	P-L
Hertogh (2015)	1182 traffic violators	43.1	.29	Netherlands	L	PL	Intentions	C	.25	.37	.28
Hinds and Murphy (2007)	2611 adults	48.5	.56	Australia	P	P		C			.51
Huq et al. (2011)	300 Muslims	38.0	.53	US	P	P		C			.28
	200 non-Muslims	52.0	.52	US	P	P		C			.31
Jackson et al. (2012)	937 adults	44.9	.55	England	P	PL	Behavior	C	.14	.10	.49
Jackson et al. (2013)	1017 minorities	23.0	.00	England	P	P		C			.68
Jeleniewski (2014)	392 MS students	12.1	.50	US	P	P	Behavior	L	.08	.36	.28
Johnson et al. (2014)	603 adults	36.0	.50	Trinidad	P	P		C			.47
Jonathan-Zamir and Weisburd (2013)	312 adults	43.5	.49	Israel	P	P		C			.49
	1104 adults	45.9	.52	Israel	P	P		C			.55
Jorgensen (2011)	337 adults	31.5	.25	US	P	P	Behavior	C	.04	.05	.77
Kochel et al. (2013)	280 crime victims	36.5	.39	Trinidad	P	PL		C			.43
Leslie et al. (2017)	369 young adults	20.9	.57	Australia	P	PL		C			.57
Liu and Liu (2018)	711 HS students	16.8	.48	China	P	P	Behavior	C	.06	.21	.42
Madon et al. (2016)	800 Muslim adults	34.9	.50	Australia	P	P		C			.68
Mazerolle et al. (2013)	2746 adults	47.2	.51	Australia	P	L		C			.48
Mondak (1999)	150 adults	46.0	.58	US	C	C		L			.08
Muratbegović et al. (2014)	583 college students	22.5	.64	Bosnia	P	P		C			.54
Murphy (2015)	513 youth	15.2	.49	Australia	P	P		C			.31
Murphy and Cherney (2011)	1204 youth and adults	56.1	.54	Australia	P	P		C			.63
Murphy et al. (2008)	2611 adults	48.5	.39	Australia	P	P		C			.55
Murphy et al. (2016)	359 Tax Offenders	49.4	.16	Australia	T	T	Behavior	L	.11	.22	.57
Paternoster et al. (1997)	825 suspects	26.4	.00	US	P		Behavior	L	.08		

Table 1 (continued)

Study	Sample	Age	%F	Location	PJ	Legit	Compliance	Design	P-C	L-C	P-L
Penner et al. (2014)	92 probationers	15.9	.27	Canada	Y	Y	Behavior	C	.03[4]	.16[4]	.67[4]
	73 probationers[1]	15.9	.27	Canada	Y	Y	Behavior	L	.36	.32	.76
Pryce (2014)	287 immigrants	40.3	.54	US	P	P		C			.55
Reisig and Mesko (2009)	103 inmates	37.5	.00	Slovenia	R	R	Behavior	C	.38	.13	−.01
Reisig et al. (2007)	450 adults	47.8	.54	US	P	P		C			.65
Reisig et al. (2011)	633 college students	20.1	.56	US		CP	Behavior	C		.16	
Reisig et al. (2014)	684 HS students	20.3	.61	Slovenia	P	P	Behavior	C	.17	.22	.52
Sargeant et al. (2014)	9819 adults	51.7	.61	Australia	P	P		C			.63
Sherman et al. (1998)	249 young offenders	17.7	.24	Australia	PL	PL	Behavior	C	.13	.16	.59
Slocum et al. (2016)	2919 youth	11.8	.50	US	P		Behavior	L	.03		
Sun et al. (2017)	929 adults	37.4	.53	China	P	P		C			.52
Sunshine and Tyler (2003)	586 adults	48.0	.62	US	P	P	Behavior	C		.22	.62
	1653 adults	26.0	.55	US	P	P	Behavior	C		.16	.44
Tankebe (2008)	374 adults	30.5	.39	Ghana	P	P		C			.54
Tatar et al. (2012)	94 inmates	18.7	1.00	US	L		Behavior	C	.04		
Trinkner and Cohn (2014)	322 HS students	16.4	.59	US	P	P	Behavior	C	.33	.40	.63
	259 young adults	19.2	.66	US	P	P	Intention	C	.22	.32	.63
Tyler and Huo (2002)	1656 adults	38.2	.50	US	PL	L		C			.73
Tyler and Rasinski (1991)	636 adults			US	C	C		C			.42
Van Damme and Pauwels (2016)	1659 college students	21.6	.74	Belgium	P	PL	Behavior	C	.06	.13	.67
Van der Toorn et al. (2011)	830 adults	49.5	.56	US	P	P		L			.29
Vidal et al. (2017)	98 detained youth	15.8	.14	US	P	P		C			.49
Walters (2018)	1142 delinquents	19.0	.00	US	PC	PC	Behavior	L	.04	.14	.27

Table 1 (continued)

Study	Sample	Age	%F	Location	PJ	Legit	Compliance	Design	P-C	L-C	P-L
Watson et al. (2010)	154 adults w/ MH	42.5	.29	US	P	P		C			.42
White et al. (2016)	2262 arrestees	32.5	.24	US	P	P	Behavior²	C	.09	.06	.61
							Behavior³	C	.12	.12	
Wolfe (2011)	301 college students	21.3	.58	US	P	P		C			.58
Wolfe et al. (2016)	1681 adults	57.0	.66	US	P	P		C			.31

Study = research study from the current meta-analysis; Sample = number and description (*MS* middle school, *HS* high school, *MH* mental health) of participants in each study (¹ subsample of Penner *N* = 92); Age = average age (in years) of study participants; %F = proportion of females in the sample; Location = country where the study took place, PJ = target of procedural justice perceptions (*P* police, *L* legal system, *T* tax office, *C* courts, *J* judges, *W* lawyers, *R* correctional system, *Y* youth justice system); Legit = target of legitimacy beliefs (*P* police, *L* legal system, *T* tax office, *C* courts, *J* judges, *R* correctional system, *Y* youth justice system); Compliance = type of compliance with the law, Behavior = actual offending behavior (² prior arrest in the past 12 months, ³ any illegal income), Intention = intention to offend in the future; Design = research design (*C* cross-sectional, *L* longitudinal), P-C = correlation between procedural justice perceptions and compliance (⁴ taken from Penner 2012); L-C = correlation between legitimacy beliefs and compliance (⁴ taken from Penner 2012); P-L = correlation between procedural justice perceptions and legitimacy beliefs (⁴ taken from Penner 2012)

Table 2 Summary of the pooled effect sizes and heterogeneity, publication bias, and sensitivity analyses for the three univariate path coefficients for all studies and for longitudinal studies

Path	k	N	Effect [95% CI]	Heterogeneity				Publication bias		Sensitivity
				Q	df	p	I^2	T&F	Adjusted effect	
All studies										
P and L (a)	86	104,989	.468 [.439, .496]	2993.99	85	<.001	97.16	0	.468 [.439, .496]	.464–.472
L and C (b)	55	72,237	.140 [.117, .163]	516.47	54	<.001	89.54	0	.140 [.117, .163]	.135–.143
P and C (c)	56	71,407	.102 [.082, .122]	368.14	55	<.001	85.06	0	.102 [.082, .122]	.095–.105
Longitudinal studies										
P and L (a)	7	4134	.366 [.243, .477]	102.60	6	<.001	94.15	0	.366 [.243, .477]	.296–.404
L and C (b)	7	5407	.225 [.148, .299]	46.96	6	<.001	87.22	2	.190 [.114, .263]	.201–.247
P and C (c)	8	6978	.064 [.020, .108]	17.82	7	.013	60.71	0	.064 [.020, .108]	.051–.075

Path = paths in the Tyler model, P and L = correlation between procedural justice and legitimacy, L and C = correlation between legitimacy and compliance, P and C = correlation between procedural justice and compliance (c path); k = number of samples used to calculate pooled effects; N = number of participants included in the path estimate; Effect [95% CI] = pooled mean effect size (r) for each path with the 95% confidence interval in brackets; ; Q = Cochran Q statistic for assessing heterogeneity; df = degrees of freedom for the Q statistic, p = significance level of the Q statistic, I^2 = I-squared heterogeneity statistic, T&F = number of samples that had to be imputed to the right of the mean to form a symmetrical funnel plot using Duval and Tweedie's (2000) trim and fill procedure; Adjusted Effect = adjusted pooled effect size after studies imputed using Duval and Tweedie's (2000) trim and fill procedure; Sensitivity = range of pooled effect sizes when studies are removed from the analysis one at a time
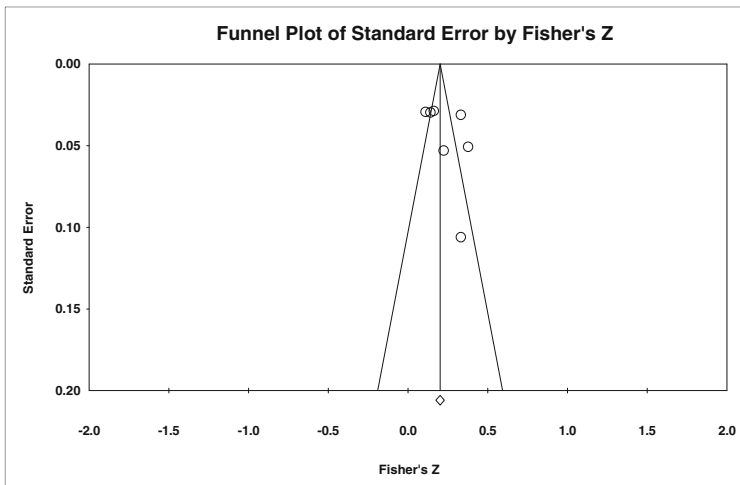
Fig. 1 Funnel plot for the *b* path (legitimacy and compliance) of studies using longitudinal data (*n* = 8).

and cross-sectional studies produced higher procedural justice and compliance coefficients (*c* path).

Discussion

Tyler's (2003, 2006) process-based self-regulation model can be broken down into two parts. The first part assumes that perceptions of procedural justice lead to beliefs about the legitimacy of criminal justice professionals. Individuals who perceive that they are treated in a fair and respectful manner by the police and courts are more likely to view the police and courts as moral, trustworthy, and legitimate. Conversely, someone who perceives that they have been treated unfairly by the police or courts is more likely to view the police and courts as immoral, untrustworthy, and illegitimate. The second part of the process-based model asserts that procedural justice and legitimacy increase people's willingness to cooperate with the authorities and comply with the law. The first part of the process-based model received strong support in a meta-analysis where procedural justice perceptions and legitimacy beliefs were found to correlate moderately (Donner et al. 2015). The second part of the process-based model received preliminary support in a meta-analysis where procedural justice and legitimacy were shown to correlate with a person's willingness to cooperate with the authorities and comply with the law (Mazerolle et al. 2013). This second meta-analysis was limited, however, by the fact that cooperation with legal authorities and compliance with the law were evaluated together rather than separately, which is all the more important because there is evidence that the effect of procedural justice on cooperation and compliance may be more appropriately attributed to legitimacy (Fagan and Piquero 2007; Levi et al. 2009; Tyler et al. 2007).

Table 3 Summary of the path analysis results obtained using the generalized least squares (GLS) method

Samples	k	P and L (a)		L and C (b)		P and C (c')	
		β [95% CI]	z	β [95% CI]	z	β [95% CI]	z
All samples	95	0.455 [0.427, 0.483]	31.98*	0.115 [0.090, 0.140]	9.04*	0.053 [0.031, 0.075]	4.68*
Full samples	50	0.436 [0.406, 0.466]	28.22*	0.106 [0.083, 0.128]	9.18*	0.057 [0.038, 0.076]	5.74*
All longitudinal samples	12	0.323 [0.229, 0.417]	6.75*	0.215 [0.133, 0.297]	5.14*	− 0.007 [− 0.061, 0.046]	− 0.26
Full longitudinal samples	5	0.390 [0.268, 0.513]	6.26*	0.213 [0.117, 0.310]	4.34*	0.016 [− 0.044, 0.075]	0.52

All Samples = samples with one or more correlations between procedural justice, legitimacy, and compliance; Full Samples = samples with all three correlations between procedural justice, legitimacy, and compliance; All longitudinal studies = samples from longitudinal studies with one or more correlations between procedural justice, legitimacy, and compliance; Full Longitudinal Samples = samples from longitudinal studies with all three correlations between procedural justice, legitimacy, and compliance; k = number of samples used in calculations; P and L (a) = relationship between procedural justice and legitimacy, or the a path of Tyler's (1990) model; L and C (b) = relationship between legitimacy and compliance controlling for procedural justice, or the b path of Tyler's (1990) model; P and C (c') = relationship between procedural justice and legitimacy controlling for legitimacy, or the c' path of Tyler's (1990) model; β [95% CI] = standardized (beta) coefficient for each path with the 95% confidence interval in brackets; z = Z test of the significance of the standardized (beta) coefficient

*$p < .05$

Table 4 Moderator variable analyses for all samples

Moderator	P–L			L–C			P–C		
	Q	df	p	Q	df	p	Q	df	p
Continuous									
Age	0.04	1	.840	19.18	1	< .001	0.75	1	.385
Gender	0.56	1	.455	1.07	1	.301	0.26	1	.612
Categorical	Q_b	df	p	Q_b	df	p	Q_b	df	p
Location	2.86	2	.240	13.34	2	.001	5.01	2	.082
	z	df	p	z	df	p	z	df	p
Police	2.98	1	.003	2.52	1	.012	− 0.36	1	.723
Compliance	− 0.54	1	.589	− 1.63	1	.103	− 1.22	1	.222
Design	2.88	1	.004	− 2.56	1	.010	2.35	1	.019

Moderator = moderator variables broken down into continuous and categorical, Age = mean age of sample, Gender = proportion of females in sample; Location = North America vs. Europe vs. Other, Police = exclusive police vs. non-exclusive police, Compliance = behavior vs. intention, Design = cross-sectional vs. longitudinal; P and L = relationship between procedural justice and legitimacy; L and C = relationship between legitimacy and compliance; P and C = relationship between procedural justice and compliance; Q = Cochrane's Q statistic; Q_b = Q between group statistic; z = Z test for the differences in slope based on an asymptotic normal approximation to the distribution of the synthetic slope; df = degrees of freedom; p = significance level of Q statistic or Z test

The purpose of the present meta-analysis was to determine whether procedural justice and legitimacy relate differentially to people's compliance with the law, a topic that has received far less attention than people's willingness to cooperate with the authorities (Reisig et al. 2014). Univariate and multivariate meta-analyses performed on 95 samples of participants ($N = 112,313$), using a random effects model, showed that while legitimacy beliefs achieved slightly higher correlations with compliance than procedural justice, both sets of correlations were significant. Restricting the analyses to studies and samples with longitudinal data, however, changed the results of the multivariate analyses. Whereas the *a* path of the path analytic model (from procedural justice to legitimacy) achieved a significant and moderately sized pooled effect size and the *b* path (from legitimacy to compliance) displayed a significant and modest to moderately sized pooled effect size, the *c'* path (from procedural justice to compliance) was nonsignificant. This occurred regardless of whether all 12 longitudinal samples were analyzed or the analysis was restricted to the five longitudinal samples with complete data on all three path coefficients. Hence, the research hypothesis for this study was not fully supported in the total sample of participants but did receive support when only studies and samples using longitudinal data were included in the analyses.

Several moderator variable effects surfaced in this study, and while none was sufficiently serious to alter the overall pattern of results, they nonetheless suggest possible avenues for future research. First, the univariate *a* (procedural justice and legitimacy) and *b* (legitimacy and compliance) paths were stronger when police procedural justice and legitimacy were examined, compared to when other members or components of the criminal justice system were examined. This implies that police procedural justice and legitimacy are particularly relevant to citizen's willingness to abide by the law and to scientists' efforts to understand the relationship between procedural justice, legitimacy, and compliance. Second, the univariate *a* and *c* (procedural justice and compliance) paths were strongest with cross-sectional data, whereas the univariate *b* path was strongest with longitudinal data. A moderator effect in which one path is stronger under longitudinal conditions than under cross-sectional conditions does not comport with the fact that cross-sectional data normally correlate better with one another than do longitudinal data. This finding suggests that the temporal relationship between legitimacy and compliance is robust, although this was obtained on a relatively small sample of longitudinal studies and requires replication. Third, younger individuals achieved a stronger univariate effect on the *b* path than older individuals. From this, we might surmise that adolescents and young adults, including delinquent youth, may benefit more than older adults from efforts to increase legitimacy, either through greater attention to procedural justice or other antecedents yet to be established.

Implications

The current findings have important implications for both theory and practice. For instance, these results tend to support Tyler's (2003, 2006) and Murphy's (2005) contention, clearly articulated or not, that legitimacy beliefs mediate the procedural justice–compliance relationship. When cross-sectional and longitudinal data were combined, there was support for both the indirect (*ab*) and direct (*c'*) effects of procedural justice on compliance. When analyses were restricted to longitudinal data, however, only the indirect effect was significant. Both sets of findings are consistent with Tyler's (2003, 2006) process-based model in that a significant indirect effect can occur in the absence of a significant direct or total effect due to complete mediation or a suppressor effect (Hayes 2013). Walters (2018), on the other hand, argues that perceived procedural justice is just one of several antecedent conditions capable of promoting strong legitimacy beliefs. Research is accordingly required to identify these alternate sources of legitimacy and test various alternative causal models. Whereas questions have been raised about the ability of legitimacy to serve as a mediator of the procedural justice–compliance relationship (Penner et al. 2014; Walters 2018), the longitudinal results from the present meta-analysis imply that legitimacy beliefs could either be mediators or initiators of law compliance. Such an outcome could be interpreted as evidence in favor of Tyler's (2003, 2006) contention that legitimacy is rooted in procedural justice, though it is also consistent with Walters' (2018) assertion that legitimacy alone may be

responsible for promoting law compliance. Additional longitudinal research is required to determine the relative utility of these two models given the fact that mediation is not established by statistical significance alone but by statistical significance coupled with conceptual relevance (James and Brett 1984).

A practical implication of these results is that legitimacy beliefs, even without the intervening influence of moral engagement (per Walters 2018), are effective predictors of offending behavior. It is therefore imperative that we look for ways to enhance legitimacy beliefs. In line with the process-based model, there was strong evidence in this meta-analysis of procedural justice as a reliable correlate of legitimacy beliefs. In fact, the univariate pooled effect size for the procedural justice–legitimacy coefficient was over three times that of the univariate pooled effect size for the legitimacy–compliance coefficient. Even with this, additional antecedents must be identified because legitimacy is too important a construct to leave to a single antecedent. Previously verified alternative antecedents to legitimacy include police/judicial performance and distributive justice (Sunshine and Tyler 2003; Wolfe et al. 2016). It is also possible that the legitimacy–compliance relationship exists within a developmental context, at least where serious offenders are concerned. Walters (2018), for instance, determined that low legitimacy beliefs predicted a rise in offending behavior over a period of one year for adjudicated delinquents starting around age 17, but not before. Policymakers need to understand that strong legitimacy beliefs not only promote compliance with the law but also help ensure the success of police operations and court proceedings by increasing citizens' willingness to cooperate with the criminal justice system (Tyler et al. 2015). Because there were only 5 longitudinal studies with complete data for all 3 path coefficients and just 12 longitudinal studies with complete data on at least 1 of the 3 coefficients, additional longitudinal research is required to determine if legitimacy does, in fact, predict compliance to a significantly greater degree than procedural justice.

Limitations

There are several limitations that need to be taken into account when interpreting the results of this study. First, although the meta-analysis incorporated 64 studies and 95 samples, only 12 of the samples were based on longitudinal data and just 5 of these had complete data on all 3 coefficients. These numbers fall at the low end of the acceptable range of studies in a meta-analysis (Sterne et al. 2011). Nonetheless, the 12 studies with longitudinal data averaged almost 1000 participants a piece, for a total N of 10,211. A second potential limitation of the longitudinal portion of this meta-analysis is that the time lag between variables was not always uniform across paths. In the Murphy et al. (2016) longitudinal study, for instance, procedural justice was measured at wave 1, legitimacy beliefs were measured at wave 2, and compliance was measured at wave 3. There were 2 years between waves 1 and 2 and 4 years

between waves 2 and 3. Consequently, the lag between procedural justice and compliance was 6 years, compared to a 4-year gap between legitimacy and compliance. It is difficult to gauge the impact of an additional 2 years on an already long lag (i.e., 4 years, the amount of time between waves 2 and 3), but it is possible that this could have placed the procedural justice–compliance relationship at a disadvantage relative to the legitimacy–compliance relationship. Consequently, while this procedural anomaly may have increased the mean difference between effect sizes in the longitudinal subsample to some extent, it is unlikely that it had a significant impact on the overall results of this study.

The heterogeneous nature of the results of this meta-analysis is another potential weakness that needs to be discussed. There were a number of significant moderating effects for three of the four categorical variables (location, police, and design) when comparisons were made between different levels of a variable and there was one moderating effect for one of the two continuous moderating variables (age) when the continuous variables were examined with meta-regression. Except for the design variable, where the significance of results for studies employing a longitudinal design differed fundamentally from the significance of results for studies using a cross-sectional design, there was very little variation in results across different levels of the moderator variables. Significant heterogeneity in a meta-analysis indicates that a contextual variable not included in the analysis may be exerting a significant impact on the results. The above average heterogeneity observed in the present study not only limits the conclusions that can be drawn from the results but also suggests avenues for future research. What exactly could account for the relatively high degree of heterogeneity found in this meta-analysis? One possibility is marked variability in how compliance was measured between studies. Whereas procedural justice and legitimacy were measured in fairly standard ways, there was more variability in how compliance was assessed. Thus, while the legitimacy–compliance correlation exceeded the procedural justice–compliance correlation regardless of whether a behavioral or intentional measure of compliance was utilized, other features of the outcome could also have contributed to the heterogeneity observed in this meta-analysis.

Conclusion

According to the results of the current investigation, even though legitimacy beliefs and procedural justice perceptions share almost a quarter of their variance in common, legitimacy beliefs correlated slightly higher with compliance than did procedural justice perceptions in the univariate analyses and twice as highly in the multivariate analyses. When the meta-analysis was restricted to studies with longitudinal data, legitimacy but not procedural justice predicted compliance. This illustrates the significance of policies and programs designed to elevate police and court legitimacy in the eyes of the general public. Without

such legitimization, law enforcement and the judiciary face an uphill battle in their efforts to manage and control crime given the extent to which legitimacy is tied to the public's willingness to cooperate with the authorities and comply with the law. There were several questions that could not be answered in this meta-analysis and could serve as directions for future research: among them, explaining the heterogeneity observed between studies on procedural justice, legitimacy and compliance, identifying factors other than procedural justice that may serve as antecedents to legitimacy, and investigating differences in respondent views on legitimacy and procedural justice (e.g., broad/cumulative versus direct/personal). Taking any one of these avenues to research has the potential to push this important area of research forward.

Appendix

Table 5 Measures of procedural justice, legitimacy, and compliance from the 64 studies contributing data to the current meta-analysis

Study	Procedural Justice	Legitimacy	Compliance
Akinlabi (2017)	12-item scale assessing whether police are fair and respectful in their interactions with the respondent and other members of the general public ($\alpha = .78$).	12-item scale measuring obligation to obey the police, public trust in the police, and lack of cynicism toward the police ($\alpha = .86$).	12-item delinquency scale.
Akinlabi and Murphy (2018)	8-item scale assessing fairness, neutrality, voice, and respect displayed by the police ($\alpha = .88$).	5-item scale measuring perceived appropriateness of police behavior and obligation to obey the police ($\alpha = .86$).	5-item scale assessing the intention to act within the confines of the law.
Baker (2017)	4-item scale assessing perceptions of court procedural justice, fairness and protection of people's rights ($\alpha = .75$).	5-item scale designed to measure obligation to obey the law ($\alpha = .65$).	
Baker et al. (2015)	5-item scale assessing fairness as displayed by the court ($\alpha = .76$).	3-item scale measuring perceived obligation to abide by the law ($\alpha = .64$).	

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
Beijersbergen et al. (2016)	12-item scale assessing fairness, neutrality, and having a voice in contacts with correctional staff ($\alpha = .94$).	Combined effect of two scales: a 6-item scale measuring support for criminal justice authorities ($\alpha = .86$) and a 6-item scale measuring obligation to obey the law ($\alpha = .76$).	Reconviction within 18 months of release from prison.
Bradford et al. (2015)	6-item scale assessing whether police were approachable, friendly, fair and clear in explaining why they stopped the motorist.	6-item scale measuring obligation to obey the police and moral alignment with the authority of the police.	2-item likelihood of future traffic offending scale.
Canada and Hiday (2014)	6-item scale assessing perceived fairness, voice, and respect/dignity from staff ($\alpha = .87$)		Number of arrests accrued within six months of baseline.
Chui and Cheng (2015)	20-item scale designed to assess the perceived fairness of lawyer-client interactions in Hong Kong ($\alpha = .89$).	7-item scale measuring respect for the law and the juvenile justice system in Hong Kong ($\alpha = .89$).	
Czapska et al. (2016)	14-item scale assessing police respect, trustworthiness, and neutrality in dealing with the respondent and others ($\alpha = .90$).	4-item scale measuring obligation to obey the police and trust in the police ($\alpha = .67$).	3-item wrongfulness of breaking the law scale.
D'hondt (2013).	8-item scale assessing the neutrality, fairness, and respectfulness of judges toward defendants ($\alpha = .82$)	3-item scale measuring moral alignment with judges in terms of similar values and ideas on right and wrong ($\alpha = .66$).	4-item scale on the importance of respecting the law.
Elliott et al. (2011)	11-item scale assessing whether police treat people in a pleasant, respectful, and fair manner ($\alpha = .97$).	19-item scale measuring obligation to obey the law and public trust in the police ($\alpha = .92$).	Prior criminal history versus no prior criminal history.
European Social Survey (2010)	3-item scale assessing whether police treat citizens with respect, explain their decisions, and exercise fairness ($\alpha = .80$).	Combined effect of two scales: a 2-item scale measuring trust in the police and legal system ($\alpha = .82$) and a 3-item scale measuring duty to obey the police ($\alpha = .88$).	A two-item measure designed to assess the frequency of minor offending (exaggerating or falsifying insurance claims and buying stolen goods) over the past five years.
Ferdik et al. (2014)	9-item scale assessing the quality of police decision-making and quality of treatment by police ($\alpha = .95$).	3-item scale measuring feelings of obligation to obey police officer directives ($\alpha = .55$).	

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
Fine et al. (2017)		11-item scale measuring fairness and validity of legal actors and processes ($\alpha = .82$).	Self-reported involvement in 24 different offenses during the previous 6 months.
Fine et al. (2018)	20-item scale assessing neutrality, voice, and fair treatment ($\alpha = .94$).	Combined effect of two scales: a 6-item scale measuring perceived obligation to obey the law ($\alpha = .84$) and an 11-item scale measuring respect for the police and trust in the justice system ($\alpha = .89$).	Four hypothetical crime scenarios.
Fontaine et al. (2016)		9-item scale measuring the perceived legitimacy of legal authorities like judges and police officers when child 14 years of age ($\alpha = .75$).	Violent delinquency at age 16–17 (fighting, carrying weapon, attacking someone) in the past year.
Gau et al. (2012)	4-item scale assessing perceptions of the fairness and quality of local police treatment of citizens ($\alpha = .90$).	3-item scale measuring the degree to which police are trustworthy and deserving of respect ($\alpha = .77$).	
Gobena and Van Dijke (2017)	7-item scale assessing perception that tax authority is accurate and unbiased ($\alpha = .78–.92$)		10-item voluntary compliance with the tax laws.
Harvell (2008)	Two 19-item scales assessing fairness and neutrality of the police and courts ($\alpha = .80–.84$).	11-item scale measuring respect and support for police and courts ($\alpha = .61–.74$).	
Hertogh (2015)	2-item scale assessing fairness of traffic laws and enforcement of those laws ($\alpha = .91$).	Combined effect of three scales: a 6-item scale measuring perceived obligation to follow traffic laws ($\alpha = .78$), a 4-item scale measuring support for the police ($\alpha = .86$), and a 10-item scale measuring perceived legitimacy of traffic laws ($\alpha = .65$).	Intentions to engage in six traffic-related violations (speeding, running a red light, parking violations, driving while intoxicated, using a cell phone while driving, and a general score).
Hinds and Murphy (2007)	3-item scale assessing whether police treat citizen with respect and fairness ($\alpha = .70$).	4-item scale measuring degree to which police seen as legitimate authority ($\alpha = .75$).	
Huq et al. (2011)	5 subscales designed to assess procedural justice of police, voice, neutrality, trust, and respect ($\alpha = .70–.92$).	6-item scale measuring respect for law enforcement authorities and willingness to obey	

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
		their directives (α = .72–.78).	
Jackson et al. (2012)	6-item scale assessing degree to which police treat citizens fairly (factor loadings = .80–.89).	3-item scale measuring perceived duty to obey police (factor loadings = .79–.84).	Frequency of petty criminal activity (driving violations, illegal dumping, vandalizing public property, buying stolen items, and shoplifting).
Jackson et al. (2013)	4-item scale assessing trust in how the police do their job, treat citizens, and given voice to citizen complaints (latent trait loadings = 2.54–3.32).	4-item scale measuring the degree to which the police should be obeyed and respected (latent trait loadings = 1.79–2.57).	
Jeleniewski (2014)	10-item scale assessing police treatment and fairness (α = .97).	10-item scale measuring obligation to obey the police and degree of trust in the police (α = .85).	Variety score of offending over the last 6-months for 25 offenses (e.g., assault, stealing, drug use).
Johnson et al. (2014)	10-item scale assessing quality of decision-making and quality of treatment by local police.	5-item scale measuring obligation to obey the police.	
Jonathan-Zamir and Weisburd (2013)	4-item scale assessing fairness of police decision-making and fairness of treatment by police (α = .78).	4-item scale measuring trust in the police (α = .79).	
Jorgensen (2011)	6-item scale assessing degree to which police treat citizens with respect, act professionally, and listen to all sides of the story (α = .89).	4-item scale measuring trust in police, obligation to obey the police, and sense that most police are honest (α = .80).	How complaint individual is in terms of not buying stolen property, not illegally dumping trash, not drinking where they are not supposed to, and following the traffic laws.
Kochel et al. (2013)	3-item scale assessing the degree to which police avoid using insulting language and excessive force (Raykov's reliability = .95).	4-item scale measuring obligation to obey the police and law and accept the decisions of police and legal authorities (Raykov's reliability = .93).	
Leslie et al. (2017)	7-item scale assessing whether police treat people with dignity and respect and whether their decisions are fair and trustworthy (α = .85).	5-item scale measuring trust in and need to obey the police (α = .85) and 4-item scale measuring respect for and need to obey the law (α = .73).	
Liu and Liu (2018)	3-item scale assessing fairness, respectfulness, and thoroughness of	Combined effect of two indices: a 1-item index that measures obligation	Involvement in 11 antisocial acts (graffiti, vandalism, shoplifting, theft,

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
	police decision-making ($\alpha = .87$).	to obey police and a 1-item index that assesses support for the police.	burglary, robbery, carrying a weapon, group fighting, assault, drug dealing, and animal cruelty) in the last 12 months.
Madon et al. (2016)	10-item scale assessing how much police respect the rights of citizens ($\alpha = .70$).	8-item scale measuring trust in police and willingness to obey the directions of the police ($\alpha = .85$).	
Mazerolle et al. (2013)	Scale assessing police displays of fairness and respect ($\alpha = .86$).	Scale measuring moral obligation to obey the law, the perceived consistency of the law, and engagement with the police ($\alpha = .81$).	
Mondak (1999)	4-item scale assessing fairness, voice, and trustworthiness of the U.S. Supreme Court ($\alpha = .61$).	5-item scale ascribing legitimacy to the U.S. Supreme Court and the need to abide by Court rulings ($\alpha = .66$).	
Muratbegović et al. (2014)	12-item scale assessing perceived fairness, respect, and dignity of police interactions with citizens ($\alpha = .93$).	Combined effect of two scales: a 4-item scale assessing obedience, trust, and pride in police ($\alpha = .67$) and a 2-item scale assessing obligation to obey the police ($\alpha = .85$).	
Murphy (2015)	3-item scale assessing quality of treatment and quality of decision-making ($\alpha = .61$).	4-item scale measuring confidence in and obligation to obey the police ($\alpha = .74$).	
Murphy and Cherney (2011)	6-item scale assessing the quality of treatment by the police and the quality of police decision-making ($\alpha = .87$).	5-item scale measuring respect for and confidence in the police ($\alpha = .92$).	
Murphy et al. (2008)	3-item scale assessing general perceptions on how police make decisions and treat citizens ($\alpha = .70$).	4-item scale measuring the legitimate authority person awards the police ($\alpha = .88$).	
Murphy et al. (2016)	10-item scale assessing the degree to which the tax office treats the respondent and others with fairness, respect, neutrality, and a right to be heard ($\alpha = .88$).	4-item scale measuring feelings of obligation to follow the directives of the Tax Office ($\alpha = .67$).	6-item compliance with the tax laws scale.

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
Paternoster et al. (1997)	3-item measure of police fairness and police willingness to listen to accused side of the story ($\alpha = .70$).		Number of spousal assault incidents reported to domestic violence hotline in a 6 to 22 month ($M = 14.5$) follow-up.
Penner et al. (2014)	20-item scale assessing the degree to which respondent feels they and others have been treated with respect, impartiality, trustworthiness, and the right to be heard by the youth justice system ($\alpha = .93$).	13-item scale measuring obligation to obey and general trust in the youth justice system ($\alpha = .89$).	Number of prior arrests.
Pryce (2014)	8-items scale assessing the perceived quality of treatment and decision-making by the police ($\alpha = .84$).	Combined effect of two scales: a 4-item measure of obligation to obey police ($\alpha = .87$) and a 4-items measure of trust in the institution of policing ($\alpha = .84$).	
Reisig and Mesko (2009)	6-item scale assessing the quality of prison guard decision-making and treatment ($\alpha = .83$).	3-item measuring belief in complying with prison guard directives ($\alpha = .90$).	Self-reported and official disciplinary infractions in prison.
Reisig et al. (2007)	10-item scale assessing quality of treatment and quality of decision-making by police ($\alpha = .90$).	8-item scale designed to measure obligation to obey the police and acknowledge their authority ($\alpha = .72$).	
Reisig et al. (2011)		4-item scale measuring degree to which courts guarantee everyone a fair trial.	6-item minor offending scale (e.g., driving under the influence, shoplifting, fighting).
Reisig et al. (2014)	6-item scale assessing quality of interpersonal treatment and quality of decision-making in contacts with police ($\alpha = .78$).	4-item scale measuring obligation to obey the police and degree of trust in the police ($\alpha = .63$).	6-item legal infractions committed over the past 12 months scale.
Sargeant et al. (2014)	7-item scale assessing the quality of treatment and the quality of decision-making by police ($\alpha = .86$).	2-item scale measuring trust and confidence in police ($\alpha = .89$).	
Sherman et al. (1998)	5-item scale assessing perceived fairness of police and fairness of treatment by court/conference ($\alpha = .70$).	3-item scale measuring respect for the police, respect for the justice system, and respect for the law ($\alpha = .79$).	Arrests for serious property crime (burglary, car theft).

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
Slocum et al. (2016)	3-item scale assessing perceived honesty, courteousness, and respectfulness of the police (factor loadings = .78–.85).		Presence/absence of 12 delinquent acts, ranging from minor (lying about age) to major (assaulting someone with a weapon).
Sun et al. (2017)	5-item scale assessing the degree to which police treat citizens with respect and base decisions on facts ($\alpha = .90$).	4-item scale measuring one's perceived obligation to obey the police ($\alpha = .83$).	
Sunshine and Tyler (2003) Study 1	20-item scale assessing perceptions that the police treat citizens fairly and handle decisions equitably ($\alpha = .98$).	19-item scale measuring perceived obligation to obey the directives of legal authorities, trust in the police, and express positive feelings toward the police ($\alpha = .94$).	Frequency of petty criminal activity (illegal parking, driving violations, illegal dumping, disturbing the peace, buying stolen items, shoplifting, and using drugs).
Sunshine and Tyler (2003) Study 2	11-item scale assessing perceptions that the police treat citizens fairly and handle decisions equitably ($\alpha = .98$).	19-item scale measuring perceived obligation to obey the directives of legal authorities, trust in the police, and express positive feelings toward the police ($\alpha = .84$).	Frequency of petty criminal activity (illegal parking, driving violations, illegal dumping, disturbing the peace, buying stolen items, shoplifting, and using drugs.
Tankebe (2008)	19-item scale assessing quality of treatment and quality of decision-making by po-lice ($\alpha = .90$).	6-item scale measuring the trustworthiness and honesty of local police ($\alpha = .80$).	
Tatar et al. (2012)	15-item scale assessing perceptions of fair treatment by judges, prosecutors, and own defense attorney ($\alpha = .89$).		9-item self-report of offending scale designed to identify involvement in antisocial behavior while in prison.
Trinkner and Cohn (2014)	10-item scale assessing perceptions of fair treatment and decision-making in con-tacts with the police ($\alpha = .96$).	10-item scale measuring obligation to obey the police and degree of trust in the police ($\alpha = .81$).	Number of times engaged in 23 categories of crime in the past 6 months.
Tyler and Huo (2002)	2-item index assessing the fairness of the process and ability to be heard ($\alpha = .91$).	13-item scale measuring obligation to obey the law, warm feelings toward legal authorities, and trust in legal institutions ($\alpha = .73$).	
Tyler and Rasinski (1991)	4-item scale assessing fairness, voice, and trustworthiness of the	5-item scale ascribing legitimacy to the U.S. Supreme Court and the	

Table 5 (continued)

Study	Procedural Justice	Legitimacy	Compliance
	U.S. Supreme Court ($\alpha = .72$).	need to abide by Court rulings ($\alpha = .72$).	
Van Damme and Pauwels (2016)	8-item scale assessing perceptions of fair treatment by the police and fairness in police decision-making ($\alpha = .83$).	Combined effect of three scales: a 4-item scale measuring moral alignment with the police ($\alpha = .81$), a 4-item scale measuring obligation to obey police ($\alpha = .79$), and a 4-item scale measuring perceived legitimacy of the law ($\alpha = .75$).	Number of times engaged in traffic law violations (speeding, driving while intoxicated, parking violations) in the past year.
Van der Toorn et al. (2011)	11-item scale assessing perceptions of fair treatment and decision-making from police ($\alpha = .94$).	6-item scale measuring perceived obligation to voluntarily defer to the police ($\alpha = .77$)	
Vidal et al. (2017)	19-item scale assessing the perceived fairness of and trust in local police ($\alpha = .76$).	6-item scale measuring respect and support for the police ($\alpha = .82$).	
Walters (2018)	28-item scale assessing perceptions of fairness, equity, and consistency in respondent's and others' contacts with the police and courts ($\alpha = .77$).	11-item scale measuring obligation to obey the law and degree of trust in the police and courts ($\alpha = .85$).	Total offending variety score over the next year.
Watson et al. (2010)	17-item scale assessing police fairness and good faith as well as voice ($\alpha = .94$).	5-item scale measuring obedience to police authority ($\alpha = .79$)	
White et al. (2016)	4-item scale assessing perceived quality of treatment and quality of decision making on the part of the police.	2-item scale measuring obligation to obey the law and trust in the police.	Any illegal income versus no illegal income and prior arrests versus no prior arrests.
Wolfe (2011)	9-item scale assessing how fair, respectful, and considerate police are in their dealings with citizens ($\alpha = .95$).	3-item scale measuring obligation to obey the police ($\alpha = .55$).	
Wolfe et al. (2016)	4-item scale assessing police willingness to listen to people, treat citizens with respect, treat people fairly, and explain their decisions ($\alpha = .94$).	Combined effect of a scale and index: 2-item scale measuring obligation to obey the police ($\alpha = .68$) and a single-item index measuring trust in the police.	

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