



Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

EUROCRIM 2019

Are We All Equally Persuaded by Procedural Justice?
Measuring the 'Invariance Thesis' Using Longitudinal Data and
Random Effects

Jose Pina-Sánchez & Ian Brunton-Smith



The Procedural Justice Model

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

compliance



The Procedural Justice Model

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion





The Procedural Justice Model

Introduction

Data

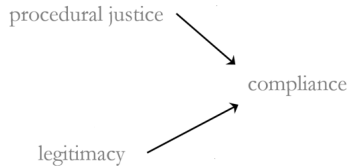
Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion





The Procedural Justice Model

Introduction

Data

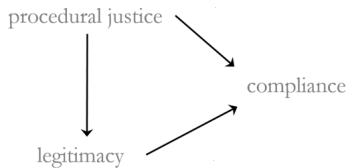
Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion



The Procedural Justice Model

Introduction

Data

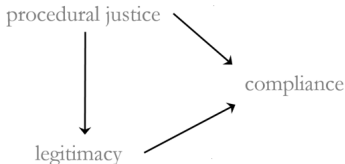
Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion



- Three decades of empirical evidence has corroborated this model in different areas of research
 - e.g. Tyler and Rasinski 1991; Murphy 2003; Hough et al. 2010

The Procedural Justice Model

Introduction

Data

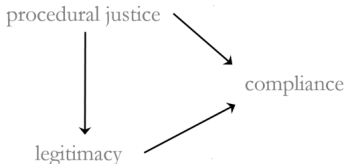
Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion



- Three decades of empirical evidence has corroborated this model in different areas of research
 - e.g. Tyler and Rasinski 1991; Murphy 2003; Hough et al. 2010
- Leading Tyler and colleagues to conclude - for some time - that the procedural justice model is universal
 - a general theory applicable across individual, contextual and cultural differences (Jackson et al. 2012; Tyler and Huo 2002; Tyler and Wakslak 2004)



The 'Invariance Thesis'

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- Wolfe et al. (2016) set out to test this 'invariance thesis'
 - Attitudes to the police in the Southeast of the US
 - Using interaction effects
 - Employed 12? individual and area level factors
 - Only 1 factor (*prior victimisation*) found to moderate *procedural justice* → *trust*



The ‘Invariance Thesis’

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

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 - Attitudes to the police in the Southeast of the US
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 - Employed 12? individual and area level factors
 - Only 1 factor (*prior victimisation*) found to moderate *procedural justice* → *trust*
 - “Tyler’s process-based model is a “general” theory of individual police legitimacy evaluations” (Wolfe et al. 2016, p. 253)

The ‘Invariance Thesis’

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- Wolfe et al. (2016) set out to test this ‘invariance thesis’
 - Attitudes to the police in the Southeast of the US
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 - Employed 12? individual and area level factors
 - Only 1 factor (*prior victimisation*) found to moderate *procedural justice* → *trust*
 - “Tyler’s process-based model is a “general” theory of individual police legitimacy evaluations” (Wolfe et al. 2016, p. 253)

- We believe that this conclusion is not yet warranted



Testing the ‘Invariance Thesis’

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- Exploring the ‘invariance thesis’ using interaction effects represents a suboptimal approach
 - Subject to practical limitations
 - The number of variables recorded in a dataset
 - Only a few number of moderating effects can be tested simultaneously before incurring in multicollinearity
 - The test is not truly ‘comprehensive’, the moderating effects are likely biased



Testing the ‘Invariance Thesis’

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- Exploring the ‘invariance thesis’ using interaction effects represents a suboptimal approach
 - Subject to practical limitations
 - The number of variables recorded in a dataset
 - Only a few number of moderating effects can be tested simultaneously before incurring in multicollinearity
 - The test is not truly ‘comprehensive’, the moderating effects are likely biased
- We propose an alternative approach based on longitudinal data and random effects modelling
 - Controls for time-invariant between subject heterogeneity
 - Estimates the variability in the ‘within’ subject effect of procedural justice across subjects
 - Allows specifying multiple potential moderating effects simultaneously



Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- We use two open longitudinal datasets

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- We use two open longitudinal datasets
- The ‘Pathways to Desistance’ study (Mulvey 2016)
 - Attitudes towards the police
 - 1,354 young offenders from two US counties, 7 waves, around 84% response rate
 - Procedural justice as a mean score of responses to 19 questions adapted from Tyler (1990) and others
 - Legitimacy based on 11 questions
 - For compliance we used self-reported frequency of offending

Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

- We use two open longitudinal datasets
- The ‘Pathways to Desistance’ study (Mulvey 2016)
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 - Procedural justice as a mean score of responses to 19 questions adapted from Tyler (1990) and others
 - Legitimacy based on 11 questions
 - For compliance we used self-reported frequency of offending
- The ‘Australian Tax System Surveys’ (Braithwaite 2009)
 - Attitudes towards the Australian Tax Authority
 - 511 subjects from the Australian general population, 3 waves, around 15% response rate
 - Procedural justice based on 5 questions
 - Legitimacy based on 4 questions - no item on the perceived ‘*obligation to obey the tax authority*’ was available
 - Compliance based on 2 questions on tax avoidance and tax evasion

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

Variable	Mean	Std. deviation	Minimum	Maximum
<i>Dataset 1 - Pathways to Desistance</i>				
<i>Level-1 variables</i>				
Procedural justice (police)	2.83	0.39	1.75	4.25
Legitimacy	2.36	0.45	1.10	3.60
Offending/noncompliance	51.66	97.88	0	900.63
<i>Level-2 variables</i>				
Female	0.14	0.34	0	1
Age	16.04	1.14	14	19
Black	0.41	0.49	0	1
Hispanic	0.33	0.47	0	1
Other ethnicity	0.05	0.21	0	1
Non US	0.06	0.24	0	1
Father at home	0.23	0.42	0	1
<i>Sample size</i>				
Level 1 – Subject-Wave:	14,894			
Level 2 – Subject:	1,354			

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

Variable	Mean	Std. deviation	Minimum	Maximum
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Other ethnicity	0.05	0.21	0	1
Non US	0.06	0.24	0	1
Father at home	0.23	0.42	0	1
<i>Sample size</i>				
Level 1 – Subject-Wave:	14,894			
Level 2 – Subject:	1,354			
<i>Dataset 2 - Australian Tax Authority</i>				
<i>Level-1 variables</i>				
Procedural justice	3.64	0.84	1	5
Legitimacy	3.22	0.72	1	5
Tax-evasion/noncompliance	2.08	0.71	1	4.5
<i>Level-2 variables</i>				
Female	0.50	0.50	0	1
Age	50.78	13.89	18	86
Foreign born	0.22	0.42	0	1
Ever audited	0.22	0.41	0	1
Requested information	1.59	0.50	1	3
Contested	1.24	0.51	1	3
<i>Sample size</i>				
Level 1 – Subject-Wave:	1,533			
Level 2 – Subject:	511			

Introduction

Data

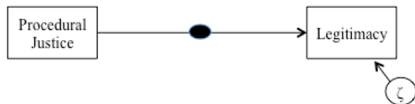
Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

Within-person



Between-person



Introduction

Data

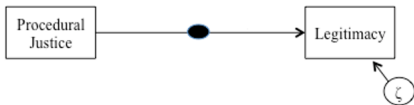
Models

Results

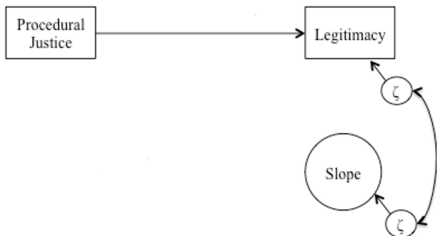
Procedural
Justice \rightarrow
ComplianceProcedural
Justice \rightarrow
Legitimacy

Discussion

Within-person



Between-person



Introduction

Data

Models

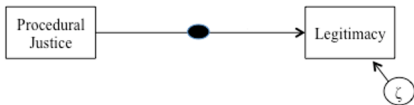
Results

Procedural
Justice →
Compliance

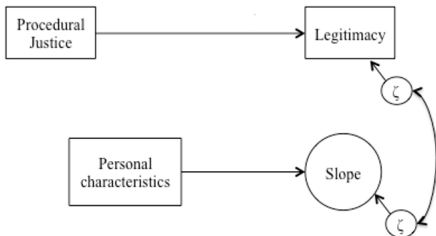
Procedural
Justice →
Legitimacy

Discussion

Within-person



Between-person



Procedural Justice → Compliance

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

	Random intercept model			Random slope model		
	Mean	SD	P-value	Mean	SD	P-value
<i>Dataset 1 - Pathways to Desistance</i>						
<i>Fixed effects</i>						
Constant	2.444	0.096	<0.001			
Legitimacy (within)	-0.439	0.037	<0.001			
Procedural justice (within)	-0.154	0.034	<0.001			
Procedural justice (between)	-0.315	0.111	0.004			
<i>Random effects</i>						
Variance compliance (within)	2.683	0.065	<0.001			
Variance compliance (between)	1.010	0.060	<0.001			
Variance slope proc just (within)						
Correlation - slope and compliance (between)						
<i>Dataset 2 - Australian Tax Authority</i>						
<i>Fixed effects</i>						
Constant						
Legitimacy (within)						
Procedural justice (within)						
Procedural justice (between)						
<i>Random effects</i>						
Variance compliance (within)						
Variance compliance (between)						
Variance slope proc just (within)						
Correlation - slope and compliance (between)						

Procedural Justice → Compliance

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

	Random intercept model			Random slope model		
	Mean	SD	P-value	Mean	SD	P-value
<i>Dataset 1 - Pathways to Desistance</i>						
<i>Fixed effects</i>						
Constant	2.444	0.096	<0.001			
Legitimacy (within)	-0.439	0.037	<0.001			
Procedural justice (within)	-0.154	0.034	<0.001			
Procedural justice (between)	-0.315	0.111	0.004			
<i>Random effects</i>						
Variance compliance (within)	2.683	0.065	<0.001			
Variance compliance (between)	1.010	0.060	<0.001			
Variance slope proc just (within)						
Correlation - slope and compliance (between)						
<i>Dataset 2 - Australian Tax Authority</i>						
<i>Fixed effects</i>						
Constant	2.381	0.110	<0.001			
Legitimacy (within)	-0.095	0.033	0.004			
Procedural justice (within)	0.036	0.035	0.302			
Procedural justice (between)	-0.295	0.082	<0.001			
<i>Random effects</i>						
Variance compliance (within)	0.303	0.018	<0.001			
Variance compliance (between)	0.188	0.020	<0.001			
Variance slope proc just (within)						
Correlation - slope and compliance (between)						

Procedural Justice → Compliance

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

	Random intercept model			Random slope model		
	Mean	SD	P-value	Mean	SD	P-value
<i>Dataset 1 - Pathways to Desistance</i>						
<i>Fixed effects</i>						
Constant	2.444	0.096	<0.001	2.434	0.097	<0.001
Legitimacy (within)	-0.439	0.037	<0.001	-0.435	0.037	<0.001
Procedural justice (within)	-0.154	0.034	<0.001	-0.174	0.036	<0.001
Procedural justice (between)	-0.315	0.111	0.004	-0.264	0.040	0.218
<i>Random effects</i>						
Variance compliance (within)	2.683	0.065	<0.001	2.672	0.066	<0.001
Variance compliance (between)	1.010	0.060	<0.001	0.990	0.059	<0.001
Variance slope proc just (within)				0.066	0.064	0.303
Correlation - slope and compliance (between)				-0.727	0.409	0.075
<i>Dataset 2 - Australian Tax Authority</i>						
<i>Fixed effects</i>						
Constant	2.381	0.110	<0.001			
Legitimacy (within)	-0.095	0.033	0.004			
Procedural justice (within)	0.036	0.035	0.302			
Procedural justice (between)	-0.295	0.082	<0.001			
<i>Random effects</i>						
Variance compliance (within)	0.303	0.018	<0.001			
Variance compliance (between)	0.188	0.020	<0.001			
Variance slope proc just (within)						
Correlation - slope and compliance (between)						

Procedural Justice → Compliance

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion

	Random intercept model			Random slope model		
	Mean	SD	P-value	Mean	SD	P-value
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<i>Fixed effects</i>						
Constant	2.444	0.096	<0.001	2.434	0.097	<0.001
Legitimacy (within)	-0.439	0.037	<0.001	-0.435	0.037	<0.001
Procedural justice (within)	-0.154	0.034	<0.001	-0.174	0.036	<0.001
Procedural justice (between)	-0.315	0.111	0.004	-0.264	0.040	0.218
<i>Random effects</i>						
Variance compliance (within)	2.683	0.065	<0.001	2.672	0.066	<0.001
Variance compliance (between)	1.010	0.060	<0.001	0.990	0.059	<0.001
Variance slope proc just (within)				0.066	0.064	0.303
Correlation - slope and compliance (between)				-0.727	0.409	0.075
<i>Dataset 2 - Australian Tax Authority</i>						
<i>Fixed effects</i>						
Constant	2.381	0.110	<0.001	2.392	0.108	<0.001
Legitimacy (within)	-0.095	0.033	0.004	-0.097	0.032	0.003
Procedural justice (within)	0.036	0.035	0.302	0.031	0.035	0.371
Procedural justice (between)	-0.295	0.082	<0.001	-0.323	0.083	<0.001
<i>Random effects</i>						
Variance compliance (within)	0.303	0.018	<0.001	0.293	0.018	<0.001
Variance compliance (between)	0.188	0.020	<0.001	0.181	0.021	<0.001
Variance slope proc just (within)				0.026	0.020	0.185
Correlation - slope and compliance (between)				-0.158	0.192	0.412



	Random intercept model			Random slope model			Random slope model including predictors		
	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value
<i>Dataset 1 - Pathways to Desistance</i>									
<i>Fixed effects</i>									
Constant	2.338	0.010	<0.001						
Procedural justice (within)	0.207	0.011	<0.001						
Procedural justice (between)	0.721	0.033	<0.001						
<i>Random effects</i>									
Variance legitimacy (within)	0.165	0.004	<0.001						
Variance legitimacy (between)	0.125	0.006	<0.001						
Variance slope proc just (within)									
Correlation - slope and legitimacy (between)									
<i>Predictors of the random slope</i>									
Female									
Age									
Black									
Hispanic									
Other ethnicity (ref. category: white)									
Non US									
Father at home									
<i>Dataset 2 - Australian Tax Authority</i>									
<i>Fixed effects</i>									
Constant	3.230	0.019	<0.001						
Procedural justice (within)	0.206	0.030	<0.001						
Procedural justice (between)	0.694	0.039	<0.001						
<i>Random effects</i>									
Variance legitimacy (within)	0.233	0.014	<0.001						
Variance legitimacy (between)	0.083	0.012	<0.001						
Variance slope proc just (within)									
Correlation - slope and legitimacy (between)									
<i>Predictors of the random slope</i>									
Female									
Age									
Foreign born									
Audited									
Contested									
Requested information									

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion



	Random intercept model			Random slope model			Random slope model including predictors		
	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value
<i>Dataset 1 - Pathways to Desistance</i>									
<i>Fixed effects</i>									
Constant	2.338	0.010	<0.001	2.338	0.010	<0.001			
Procedural justice (within)	0.207	0.011	<0.001	0.207	0.010	<0.001			
Procedural justice (between)	0.721	0.033	<0.001	0.728	0.034	<0.001			
<i>Random effects</i>									
Variance legitimacy (within)	0.165	0.004	<0.001	0.158	0.003	<0.001			
Variance legitimacy (between)	0.125	0.006	<0.001	0.123	0.005	<0.001			
Variance slope proc just (within)							0.031	0.004	<0.001
Correlation - slope and legitimacy (between)				0.079	0.057	0.169			
<i>Predictors of the random slope</i>									
Female									
Age									
Black									
Hispanic									
Other ethnicity (ref. category: white)									
Non US									
Father at home									
<i>Dataset 2 - Australian Tax Authority</i>									
<i>Fixed effects</i>									
Constant	3.230	0.019	<0.001	3.233	0.019	<0.001			
Procedural justice (within)	0.206	0.030	<0.001	0.200	0.030	<0.001			
Procedural justice (between)	0.694	0.039	<0.001	0.696	0.038	<0.001			
<i>Random effects</i>									
Variance legitimacy (within)	0.233	0.014	<0.001	0.220	0.014	<0.001			
Variance legitimacy (between)	0.083	0.012	<0.001	0.072	0.013	<0.001			
Variance slope proc just (within)							0.035	0.013	0.005
Correlation - slope and legitimacy (between)				0.084	0.149	0.572			
<i>Predictors of the random slope</i>									
Female									
Age									
Foreign born									
Audited									
Contested									
Requested information									

Introduction

Data

Models

Results

Procedural
Justice →
ComplianceProcedural
Justice →
Legitimacy

Discussion



	Random intercept model			Random slope model			Random slope model including predictors		
	Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value
<i>Dataset 1 - Pathways to Desistance</i>									
<i>Fixed effects</i>									
Constant	2.338	0.010	<0.001	2.338	0.010	<0.001	2.338	0.010	<0.001
Procedural justice (within)	0.207	0.011	<0.001	0.207	0.010	<0.001	0.255	0.021	<0.001
Procedural justice (between)	0.721	0.033	<0.001	0.728	0.034	<0.001	0.781	0.039	<0.001
<i>Random effects</i>									
Variance legitimacy (within)	0.165	0.004	<0.001	0.158	0.003	<0.001	0.158	0.003	<0.001
Variance legitimacy (between)	0.125	0.006	<0.001	0.123	0.005	<0.001	0.123	0.005	<0.001
Variance slope proc just (within)				0.031	0.004	<0.001	0.030	0.004	<0.001
Correlation - slope and legitimacy (between)				0.079	0.057	0.169	0.103	0.061	0.090
<i>Predictors of the random slope</i>									
Female							-0.033	0.027	0.218
Age							0.002	0.008	0.846
Black							-0.019	0.026	0.456
Hispanic							-0.066	0.026	0.011
Other ethnicity (ref. category: white)							-0.081	0.047	0.083
Non US							-0.011	0.037	0.766
Father at home							-0.031	0.023	0.190
<i>Dataset 2 - Australian Tax Authority</i>									
<i>Fixed effects</i>									
Constant	3.230	0.019	<0.001	3.233	0.019	<0.001	3.245	0.019	<0.001
Procedural justice (within)	0.206	0.030	<0.001	0.200	0.030	<0.001	0.245	0.043	<0.001
Procedural justice (between)	0.694	0.039	<0.001	0.696	0.038	<0.001	0.741	0.053	<0.001
<i>Random effects</i>									
Variance legitimacy (within)	0.233	0.014	<0.001	0.220	0.014	<0.001	0.217	0.014	<0.001
Variance legitimacy (between)	0.083	0.012	<0.001	0.072	0.013	<0.001	0.068	0.012	<0.001
Variance slope proc just (within)				0.035	0.013	0.005	0.032	0.012	0.005
Correlation - slope and legitimacy (between)				0.084	0.149	0.572	0.157	0.150	0.296
<i>Predictors of the random slope</i>									
Female							-0.121	0.043	0.005
Age							-0.002	0.002	0.284
Foreign born							-0.009	0.053	0.861
Audited							-0.071	0.051	0.158
Contested							0.027	0.057	0.629
Requested information							0.062	0.043	0.148

Procedural Justice \rightarrow Legitimacy

Introduction

Data

Models

Results

Procedural
Justice \rightarrow
Compliance

Procedural
Justice \rightarrow
Legitimacy

Discussion

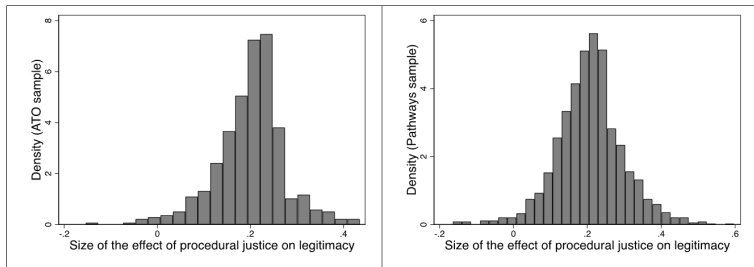


Figure: Between subject variability, of the within subject relationship, between procedural justice and legitimacy (left tax data, right police data)



Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
Justice →
Legitimacy

Discussion

Discussion

- We find no evidence of between subject variability in the relationship between procedural justice and compliance
 - But we do find meaningful variability in the relationship between procedural justice and legitimacy
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 - Which underlines the importance of the modelling strategy

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Introduction

Data

Models

Results

Procedural
Justice →
Compliance

Procedural
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- Still, our findings are based on just two studies
 - We need to get better - myself included - at sharing our data
 - To facilitate replications and to push the methodological frontier