Assessing the measurement invariance and antecedents of legal cynicism in São Paulo, Zurich, and Montevideo

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ABSTRACT

Introduction: This paper accomplishes two goals. First, we assesses the measurement invariance of legal cynicism among adolescents in São Paulo, Brazil, Montevideo, Uruguay, and Zurich, Switzerland. Second, we evaluate a series of social and individual antecedents that are expected to influence legal cynicism across contexts.

Methods: This paper first evaluates the measurement invariance of legal cynicism using Multigroup Confirmatory Factor Analysis with three randomized clustered samples of adolescents in Zurich (n = 1447), São Paulo (n = 2680) and Montevideo (n = 2204). Second, we assessed the correlates for legal cynicism in each city using structural equation modelling techniques.

Results: The results demonstrated metric invariance, but not scalar invariance among adolescents in São Paulo, Zurich, and Montevideo. We were able to establish partial measurement invariance for legal cynicism in São Paulo and Zurich, and therefore proceeded with the comparison of latent means and antecedents. The results show that on average legal cynicism is higher in Zurich, but that the size and strength of antecedents were similar across cities. Low self-control was by far the strongest correlate of legal cynicism.

Conclusions: Overall, our results suggest that current operationalizations of legal cynicism may not be rooted in social structural context and experiences with legal authorities, but rather reflect how individuals interpret legal boundaries and dispositions towards rule-breaking. Researchers must reconsider how legal cynicism fits into models of legal socialization, and whether developmental models of self-control may help us understand the origins and nature of legal cynicism, as it is currently measured.

1. Introduction

Legal socialization concerns the processes by which children and adolescents acquire knowledge and develop beliefs about the law and its representatives (Cohn et al., 2012; Fagan & Tyler, 2005; Nivette et al., 2015; Trinkner et al., 2020). As a dimension of legal socialization, the concept of legal cynicism has become prominent in research on adolescents as a mechanism that contributes to the delegitimization of the law and justification of rule-breaking behaviors (Fine et al., 2018; Kaiser & Reisig, 2019; McLean & Wolfe,

2016; Nivette et al., 2020; Trinkner & Cohn, 2014). Introduced by Sampson and Bartusch (1998, p. 786), legal cynicism is defined as "the sense in which the laws or rules are not considered binding" and is said to emerge as an adaptation to societal alienation and experiences of injustice by legal and non-legal authorities (Kirk & Papachristos, 2011; Tyler & Trinkner, 2017).

With growing evidence that legal cynicism is linked to criminal behavior (Fine et al., 2018; Kaiser & Reisig, 2019; McLean & Wolfe, 2016; Trinkner & Cohn, 2014), researchers are increasingly interested in how these attitudes develop outside the Global North (Trinkner et al., 2020). The vast majority of studies are conducted in countries that are relatively similar in terms of institutional stability, security, and a general acceptance of the utility of the police (i.e. the United States, United Kingdom, and Switzerland, see e.g. Nivette et al., 2020; Trinkner et al., 2020). Existing comparative research on related concepts such as police legitimacy suggests that the antecedents and processes may differ in societies with more systemic problems of institutional corruption and insecurity (Bradford et al., 2014; Jackson et al., 2014; Kochel et al., 2013; Tankebe, 2009; Trinkner et al., 2020). However, comparisons between countries are often implicit, and to our knowledge no study has examined broader social and developmental antecedents of legal cynicism using comparable samples as well as instruments (see generally on measurement, Gifford & Reisig, 2019; Walters & Bolger, 2019).

This paper therefore accomplishes two goals. First, as an important prerequisite for cross-cultural comparisons, this paper assesses the measurement invariance of legal cynicism among adolescents (mean age 15) in three different languages and social contexts: São Paulo, Brazil (Portuguese), Montevideo, Uruguay (Spanish), and Zurich, Switzerland (German).

Second, conditional on the findings for measurement invariance, we evaluate a series of social and individual antecedents that are expected to influence legal cynicism across contexts. The São Paulo context is characterized by substantially higher levels of structural inequality, insecurity, and police violence and corruption compared to Zurich (Cardia et al., 2003, pp. 14–33; Peres & Nivette, 2017; Ruotti et al., 2009). Although Montevideo levels of inequality are low compared to São Paulo, violence, insecurity and police abuse remain significantly high even in the South American context (Cruz, 2009; Maciel, 2018; OPP, 2018; Trajtenberg & Eisner, 2015). A comparative design allows for a more rigorous test of generalizability (Anckar, 2008). In this case, when average levels of legal cynicism are equal across three very different social contexts, we can assume that the contextual differences (e.g. corruption, police violence, insecurity) are not relevant for explaining legal cynicism. Similarly, if we find that the various individual-level social and individual predictors are related to legal cynicism in the same way and to the same degree across contexts, then we can be more certain that the relationship does not vary across settings.

2. Legal cynicism and legal socialization

Theoretical models of legal socialization identify several social domains that are expected to influence legal cynicism, including family, school, peers, and criminal justice (McLean & Wolfe, 2016; Tyler & Trinkner, 2017). Social actors within these domains can shape attitudes through the characteristics of their authority as well as the socio-emotional bonds they have with the individual (Trinkner & Cohn, 2014; Wolfe et al., 2017). According to the procedural justice model of legal socialization, fair and respectful treatment by authorities (e.g. police, teachers, parents) promotes the internalization of positive civic attitudes (Trinkner & Cohn, 2014). Socio-emotional bonds and attachments with prosocial others can promote the internalization of moral norms and discourage attitudes and behaviors that might weaken these bonds (Ferdik et al., 2014).

It is important to note that the vast majority of evidence for legal socialization models is drawn from high income societies, meaning there are still open questions about whether these processes operate similarly in low- and middle-income countries (see e.g. Medina & Rodrigues, 2019; Reisig & Lloyd, 2009; Thomas et al., 2018; Trinkner et al., 2020). For example, in some societies, historical legacies of authoritarianism and repression influence citizens' "baseline assumption" about the utility of the police (Bradford et al., 2014, p. 260), meaning individuals may place greater emphasis on effectiveness and security when forming attitudes about the law and police (Nivette & Akoensi, 2019; Tankebe, 2009). While there is emerging evidence that social actors within family and criminal justice domains shape legitimacy beliefs in Brazil (e.g. Thomas et al., 2018, 2020), the evidence does not extend to legal cynicism outcomes (Trinkner et al., 2020). However, as of yet no studies conducted in low- or middle-income countries have examined the relative influence of multiple social domains while accounting for individual predispositions, such as low self-control. Evaluating the generalizability of legal socialization models would therefore benefit from testing multiple social domains in societies with varying levels of security, corruption, and violence.

During adolescence, parents and teachers play important roles as "rule enforcers" that can shape attitudes towards rules and authorities (Cavanaugh & Cauffman, 2015; Flexon et al., 2009; Nihart et al., 2005; Sargeant & Bond, 2015; Trinkner et al., 2020; Trinkner & Cohn, 2014). Parenting practices and teacher-child relationships reflect models of authority that can vary in terms of quality of treatment, decision-making, and trustworthiness (Tyler & Trinkner, 2017). However, research on the effects of parent- and school-related influences on legal cynicism is relatively mixed, both in studies conducted in the United States (see e.g. Fagan & Tyler, 2005; Ferdik et al., 2014; Wolfe et al., 2017), Western Europe (see e.g. Spain, Baz & Fernández-Molina, 2018; Switzerland, Nivette et al., 2015), and Brazil (see Medina & Rodrigues, 2019).

Peers also play a role in the socialization process, as adolescents who associate with delinquent peers are likely to have more negative views about the law and police (Fagan & Tyler, 2005; Ferdik et al., 2014; McLean & Wolfe, 2016). This may be because adolescents with negative attitudes are more likely to seek out 'like-minded' friends, and/or because adolescents exposed to rule-breaking and disregard for the law may change their own attitudes to conform with their peers (Brechwald & Prinstein, 2011). The link between delinquent peers and different legal attitudes tends to be fairly robust across studies and international contexts (Fagan & Tyler, 2005; Ferdik et al., 2014; Kaiser & Reisig, 2019; McLean & Wolfe, 2016; Nivette et al., 2015; but see; Fagan & Tyler, 2005; Fagan & Piquero, 2007).

These social actors may also operate indirectly to shape legal attitudes via the development of individual propensities to break rules as well as rule-breaking behaviors (Ameri et al., 2019; Augustyn & Ray, 2016; Fine et al., 2018; Nivette et al., 2015; Reisig et al., 2011). Positive parenting practices, such as support and monitoring, school/teacher attachment, and relationships with delinquent peers have been shown to influence levels of self-control among children and adolescents (Hoeve et al., 2009; Huijsmans et al., 2019; Meldrum, 2008; Turner et al., 2005; Vazsonyi & Belliston, 2007). In turn, individual propensities such as low self-control, as well as delinquent behavior can influence how adolescents interpret and interact with the law and legal authorities (Ameri et al., 2019; Augustyn & Ray, 2016; Nivette et al., 2020, 2015; Piquero et al., 2004). There is growing evidence to suggest that individuals who have low self-control, negative emotionality, low morality, and who already engage in deviant behaviors have higher levels of legal cynicism (Ameri et al., 2019; Augustyn & Ray, 2016; Fine et al., 2018; Nivette et al., 2020; Reisig et al., 2011). These individual propensities and behaviors determine how individuals interpret interactions with authorities, react to sanctions, and accept shared rules of right and wrong (Cohn et al., 2010; Mastrofski et al., 2002; Scheuerman & Matthews, 2014; Tyler & Trinkner, 2017).

2.1. Criminal justice influences

While parents, teachers, and peers are expected to shape legal cynicism especially earlier in the life course, the police are often implicitly expected to be the primary actors in the legal socialization process (Tyler & Trinkner, 2017), as most research in this area focuses on how contacts with police and procedural justice concerns shape attitudes towards the law and police (Bradford et al., 2009; Hinds & Murphy, 2007; Huq et al., 2017; Tyler & Huo, 2002). However, evidence that contacts with the police influence legal cynicism tends to be more mixed (Fagan & Tyler, 2005; Fine & Cauffman, 2015; Gau, 2015; Kaiser & Reisig, 2019; Medina & Rodrigues, 2019; Nivette et al., 2020; Piquero et al., 2005). For example, recent research conducted among adolescents in Brazil found that direct contact with the police was related to more negative perceptions of procedural justice and police legitimacy, but had no influence on legal cynicism (Trinkner et al., 2020). The authors argue that, because police officers in this context are known to abuse power and use violence, it is more likely that adolescents draw from other non-legal sources in forming their attitudes about the law.

3. The present study

Overall, there is some support for a legal socialization model that argues that adolescents learn about the law and police through social interactions and relationships with both legal and non-legal authorities. However, the evidence for legal cynicism is less clear, particularly regarding the role of parents and police in forming cynical attitudes (Fine & Cauffman, 2015; Trinkner et al., 2020). Furthermore, studies that directly compare effects across national contexts using comparable instruments are limited, and all focus on comparing attitudes towards the police (Boateng et al., 2016; Ivković, 2008; Jackson, 2018; Jang et al., 2010). Taking these limitations into account, this paper evaluates the correlates of legal cynicism across three diverse social and institutional contexts (i.e. Zurich, São Paulo, and Montevideo). Based on the review of literature, we examine a series of antecedents that reflect different domains of legal socialization, including parenting practices, school influences, deviant peers, criminal justice contacts, and individual propensities for rule-breaking. If the antecedents of legal cynicism are generalizable, we would expect that the pattern and size of associations between predictors and legal cynicism do not differ across contexts.

An important prerequisite for comparing means and regression coefficients across groups is to establish measurement invariance of the constructs (Lai et al., 2019). Assessing measurement invariance allows researchers to evaluate the extent to which legal cynicism items are perceived and measured in a similar way across groups, and the absence of invariance can indicate issues related to the interpretation or relative importance of certain items, as well as systematic biases across countries (Davidov et al., 2012). This can become problematic when interpreting differences in mean levels or predictors of legal cynicism across countries, as any differences may instead be due to measurement error rather than substantive attitudinal differences. Prior to multivariate analyses, we therefore assess measurement invariance in legal cynicism between cities.

4. Data and methods

The data used in this paper are from the Zurich Project on Social Development from Childhood to Adulthood (z-proso), an ongoing prospective longitudinal study in Zurich, the São Paulo Project on the Social Development of Children and Adolescents (sp-proso), a cross-sectional study in São Paulo, and the Montevideo Project on the Social Development of Children and Adolescents (m-proso), a cross-sectional study in Montevideo. SP-proso and m-proso were designed to support comparative analyses between criminal behavior and relevant risk factors among school-age adolescents (average age 15) in Zurich, São Paulo, and Montevideo.

Data were collected in wave 6 for z-proso in 2013, for sp-proso in 2017, and m-proso in 2013. In Zurich, the baseline sample at wave 1 was comprised of 56 primary schools with 1675 children (Eisner & Ribeaud, 2007). In wave 6, a total of 1447 adolescents (ages 14.1 to 16.9) participated. At this age, adolescents in Zurich are enrolled in grade 9, the last compulsory grade of schooling, after which they typically either begin vocational school (and an apprenticeship), or attend 'Gymnasium', a preparatory school for university. In São Paulo, the sample is comprised of 119 randomly selected public and private schools. The target sample of adolescents was 2844 students, whereby 2702 adolescents (ages 13 to 19) participated in the survey. Eligible adolescents were those present in the classroom on the day of data collection whose parents did not proscribe their child's participation, and who did not present any serious impairments that inhibited their understanding of the questions or the possibility of answering it anonymously. Out of the 2978 students present in the classroom on the day of data collection, 96 did not participate (refused or presented serious

impairment). An additional 22 questionnaires were not included in the analysis because more than 20% of the questions were not answered, resulting in a final sample of 2680 in São Paulo. In Montevideo, the target sample consisted students in the 9th grade, the final year of compulsory schooling. The sampling frame consisted of all classes in Montevideo across all public, private, and technical schools. Systematic random sampling was used to achieve a representative sample of classes and students for each school type. The target sample was 2690 students registered in the selected classrooms, of which 2204 students participated. Parents were allowed to proscribe their child's participation, and students were allowed to refuse to respond to any questions. After quality checks, 20 questionnaires were excluded that had 20% or more missing values, resulting in a final sample of 2184 in Montevideo.

For all three cities a randomized clustered sample of classes in schools were selected and the translation of the items followed recommendations for culturally sensitive translations in order to obtain cross-cultural equivalence of concepts and instruments (Behr & Shishido, 2016; Eisner & Ribeaud, 2007; Harkness et al., 2004). Translation involved skilled translators, parallel translations, reconciliation and synthesis through comparison between Spanish, German, English and Portuguese versions of the questionnaire, and a final check with the original designers of the instrument. Paper and pencil surveys were given to adolescents to complete during classroom time. A team of trained interviewers were present in the classrooms to give assistance and support to the students during data collection. In São Paulo and Montevideo, the questionnaires were anonymous for both students and schools. For more information regarding the sampling procedures and design, see Eisner et al., 2011 for z-proso, Peres et al. (2018) for sp-proso, and Trajtenberg & Eisner (2015) for m-proso.

4.1. Measures

Legal cynicism was measured using a six-item scale adapted from Sampson and Bartusch (1998) and Karstedt and Farrall (2006). Answers were given using a four-point Likert scale (ranging from "fully untrue" to "fully true") for statements such as "Laws are made to be broken" and "It's a great feeling when you break the rules and don't get caught." Three of the six items are drawn directly from Sampson and Bartusch, and the remaining three are derived from Karstedt and Farrall. It is important to note that the scale assessed here has been adapted from the original, but nevertheless contains items that closely align with the original conceptualization of "the sense in which laws or rules are not considered binding" (Sampson & Bartusch, 1998, p. 786). The observed item means and 95% confidence intervals are presented in Fig. 1.

Police legitimacy was measured using three items capturing dimensions of police performance, fairness in police decision-making and confidence in police effectiveness. Items were derived from Sunshine and Tyler (2003) and include statements such as "police treat people with dignity and respect," "I'm confident that the police can do their job well," and "police apply the rules consistently to different people" with answers indicating respondent agreement using a four-point Likert scale. All three items load well onto a one
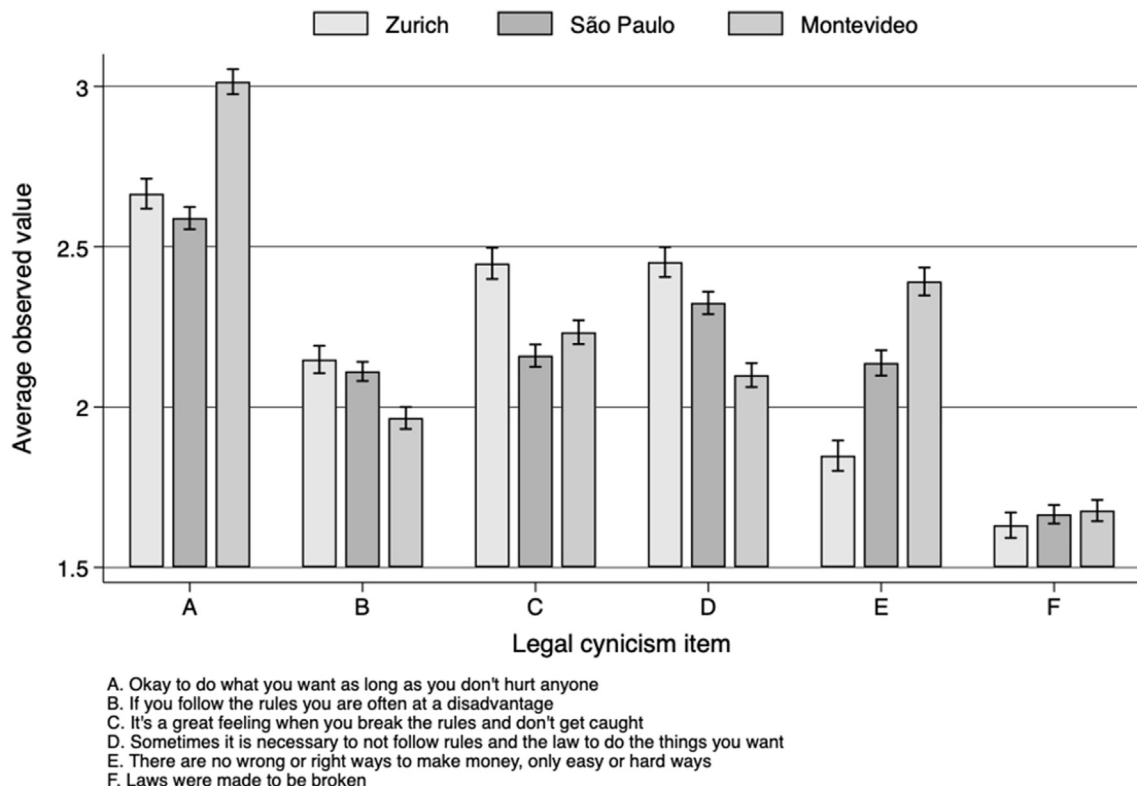

A. Okay to do what you want as long as you don't hurt anyone
B. If you follow the rules you are often at a disadvantage
C. It's a great feeling when you break the rules and don't get caught
D. Sometimes it is necessary to not follow rules and the law to do the things you want
E. There are no wrong or right ways to make money, only easy or hard ways
F. Laws were made to be broken

Fig. 1. Means and 95% confidence intervals for legal cynicism items in Zurich, São Paulo, and Montevideo.

factor solution and is reliable across sites ($\alpha_Z = 0.81$; $\alpha_{SP} = .79$; $\alpha_M = 0.81$).

Deviant peer group is a dichotomous variable that measures whether the adolescent is part of a peer group whose members commit illegal acts. This variable was created based on two distinct questions drawn from the Eurogang youth survey (Medina-Ariza et al., 2009): "Do you have a group of friends that regularly meet up to do things together, or just hang around? (yes/no)" and "Do people in your group actually do illegal things together? (yes/no)." For this paper those who answered yes to both questions were considered as taking part in a deviant peer group and coded as 1. All other responses were coded as zero. Individuals coded as 0 are considered to not take part in a group, or are part of a non-deviant peer group.

Two variables measure aspects of parental authority and interactions: *parental supervision* and *parental involvement*. Items were adapted from the Alabama Parenting Questionnaire (Shelton et al., 1996) and the Parenting Scale from the Criminological Research Institute of Lower Saxony (Kriminologisches Forschungsinstitut Niedersachsen [KFN]; Wetzels et al., 2001; Wilmers et al., 2002). These parenting measures capture broader socialization processes that can influence adolescents' prosocial attitudes and orientations, including legal attitudes. *Parental Involvement* consists of four items with statements such as "You play games or do other fun things with your parents," "Your mother or father hugs you to comfort you when you are sad," "Your parents are interested in what you do," and "When you have problem you can talk to your parents about it." *Parental supervision* were measured using four items capturing parental supervision of the adolescent's free time: where they go, whom they meet with, what they do, and whether they have to be back home at a certain time. Answers were measured using a four-point Likert scale ranging from "never" to "often/always." Items load well onto a one factor and both scales are fairly reliable across sites, with the exception of parental supervision in São Paulo (parental supervision: $\alpha_Z = 0.72$; $\alpha_{SP} = .60$; $\alpha_M = 0.68$ parental involvement: $\alpha_Z = 0.72$; $\alpha_{SP} = .75$; $\alpha_M = 0.76$).

Teacher-child bond was measured using three items adapted from the KFN studies (Wetzels et al., 2001; Wilmers et al., 2002) that reflect the adolescent's prosocial bond with the teacher as well as judgements about their authority: "I have a good relationship with my teacher," "my teacher treats me fairly," and "my teacher helps me when necessary." Agreement was measured using a four-point Likert scale (ranging from "fully false" to "fully true") and the scale is fairly reliable across sites ($\alpha_Z = .82$; $\alpha_{SP} = .72$; $\alpha_M = 0.65$).

Contact with the police was measured using a dichotomous variable that reflects any police contact in relation to wrongdoing in the year prior to the survey (yes/no). In Zurich and Montevideo, adolescents registered police contacts in relation to specific deviant behaviors, including drug-related offences, whereas in São Paulo, adolescents registered police contacts in relation to drug-related offences or other problems in general. In this way, the police contact variable across sites is not directly comparable, however they both measure negative police contact that occurs due to some form of wrongdoing.

We include three individual characteristics that are likely to influence legal cynicism and police legitimacy: *Deviant behavior*, *Low self-control*, and *Morality*. In order to measure deviant behavior, we used a 28-item variety scale. Variety scales are considered a more reliable and valid way to measure delinquency compared to other scale constructions (Sweeten, 2012). The scale includes bullying perpetration (5 questions), substance use (tobacco, alcohol and marijuana), selling drugs, rule violations (such as truancy, cheating on exams, running away from home, driving a motor vehicle without a license, illegally downloading/uploading files, and fare-jumping), theft (at school, at home, from a shop, on the streets), vandalism (spray paint/graffiti on buildings or public transport; damage to property), and violence (carrying a weapon, threatening someone with violence, robbery, and physical violence).

The capacity to exert self-control reflects an individual process related to decision making and judgement, which can influence attitudes about rules and authority (Gottfredson & Hirschi, 1990). *Low self-control* was measured using 10 items consisting of five subdimensions (impulsivity, self-centeredness, risk-seeking, preference for physical activities, and short temper) adapted from Grasmick et al. (1993). The scale shows good reliability in all three sites ($\alpha_Z = 0.73$; $\alpha_{SP} = .72$; $\alpha_M = 0.80$). The *morality* scale reflects an individual's moral evaluations about transgressions, and was measured using five items comprising judgements on distinct deviant situations: lying to adults, truancy, hitting people, stealing things worth less than US$5, and insulting others out of dislike. For each statement adolescents judged the situation based on a 7-point Likert scale ranging from "not bad at all" to "very bad". The scales in all sites can be considered reliable ($\alpha_Z = 0.77$; $\alpha_{SP} = .75$; $\alpha_M = 0.75$).

Age (in years) and gender (male/female) were measured in all cities. Other sociodemographic characteristics are not directly comparable across sites, as they were measured in different ways. In São Paulo, we used the socioeconomic score developed by the Brazilian Institute of Geography and Statistics, which is widely used in school surveys (e.g. the Brazilian National Surveys of School Health, see Azeredo et al., 2012). Items measure the possession of goods (e.g. television, TV, computer) and having a paid maid working at home. An overall SES score was computed following the methodology proposed by Levy et al. (2010). In Zurich and Montevideo, SES was measured based on the highest level of parental education, and transformed into a z-score for comparison. Given that ethnic identity can influence perceptions of police legitimacy and legal cynicism (Lee et al., 2011), we include measures that capture ethnic or migrant background. In São Paulo and Montevideo, self-identified skin-color or ethnicity was included as a binary variable (SP: 1 = black/0 = non-black; Montevideo: 1 = non-white/0 = white) since it has been associated with a higher likelihood of suffering police violence and homicide in Latin America (Cerqueira et al., 2017; Peres et al., 2018). In Zurich, we include a measure capturing one's migrant background, where 1 indicates both parents have a migrant background, and 0 indicates that one or neither parent has a migrant background.

4.2. Analytic plan

The analyses proceeded in two stages.[1] In the first stage, we assessed the measurement invariance across cities using Multigroup

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[1] As preliminary steps, we conducted exploratory and single-group confirmatory factor analyses to evaluate the underlying structure, model fit,

Confirmatory Factor Analysis [MGCFA] (Brown et al., 2017). In the first step, the configural model (Model 1) assesses whether the latent variable has the same structural pattern of factor loadings across groups (Putnick & Bornstein, 2016). In the second step, we test for metric invariance by constraining factor loadings to be equal across cities (Model 2). Metric invariance demonstrates that the items contribute to the latent variable in the same way and magnitude across cities (Steenkamp & Baumgartner, 1998). In the third step, we test for scalar invariance (Model 3), wherein both the factor loadings and item intercepts are constrained to be equal across cities. Researchers generally agree that configural, metric, and scalar invariance are necessary in order to establish measurement invariance (Brown et al., 2017).[2]

We used several indices to assess model fit and the change in fit indices between models. Since the X^2 statistic and likelihood-ratio tests comparing nested models can be affected by sample size and model complexity (Lemos et al., 2019), we base our assessment primarily on standards for acceptable fit using the CFI (0.95) and RMSEA (0.06) (Hu & Bentler, 1999). Differences between models were evaluated based on CFI values. If the differences in CFI are smaller than 0.01 between the less restrictive and more restrictive invariance models, the more restrictive invariance model may be accepted (Cheung & Rensvold, 2002).

In the second stage, conditional on establishing measurement invariance, we assessed the correlates for legal cynicism in each city using Structural Equation Modelling [SEM]. The dependent variable was predicted score for the latent variable legal cynicism based on the first stage, and the independent variables reflected a range of theoretically-relevant social and individual antecedent risk factors. The independent variables are treated as observed variables for the purpose of analyses.

In general, missingness was low across sites. In São Paulo, missingness ranged from 0.4% (contact with police) to 9% (low self-control), with missingness above 5% for teacher-child bond (5.7%) and SES (6.3%). In Zurich, missing values ranged from 0.1% (contact with police) to 5.2% (parental education). In Montevideo, missingness was lowest for contact with police (0.1%) and highest for moral values (4.9%) and low self-control (10.2%). To account for missing values in the MGCFA and SEM analyses, we used full information maximum likelihood techniques [FIML] (Allison, 2003).

Descriptive statistics and correlation matrices for all variables used in the analyses are presented in Online Appendix 2.

5. Results

5.1. Measurement invariance tests

Table 1 displays the results for the configural, metric, and scalar invariance models across three cities. The fit indices suggest a good fit to the data for the configural model (Model 1). The fit indices are also acceptable for the metric invariance model (Model 2) since the difference in CFA between Model 1 and 2 is less than 0.01 (Diff. = 0.009). The fit indices for the scalar invariance model (Model 3) become significantly worse, with a difference in CFI of 0.177. This means that scalar invariance of legal cynicism across cities is not confirmed.

Since we were unable to establish scalar MI, we attempted to establish partial scalar invariance (Steenkamp & Baumgartner, 1998) by systematically constraining factor intercepts and comparing the resulting model fit (change in CFI) to the metric invariance model. If at least two item intercepts are invariant across cities, and the difference in CFI is less than 0.01, then partial scalar invariance, and therefore partial MI, can be confirmed (Van de Schoot et al., 2012). It is then possible to make comparisons of latent means and path coefficients across groups (Lai et al., 2019).[3]

The results in Table 1 show that we were not able to establish partial scalar invariance for all three cities. As a next step, we examined whether partial scalar invariance was possible in two out of three cities. When excluding Montevideo from the analysis, we were able to establish partial scalar invariance for legal cynicism between São Paulo and Zurich only (see Table 2).[4]

5.2. Cross-cultural antecedents of legal cynicism

Having established partial scalar equivalence between São Paulo and Zurich, we are able to directly compare the latent means and correlates in these two cities. In order to do so, we constrained the latent mean of legal cynicism in São Paulo to 0. The results show that levels of legal cynicism are on average significantly higher (M = 0.53, p < .001) in Zurich compared to São Paulo.

(*footnote continued*)

and number of factors for each city separately (see Online Appendix 1).

[2] The MGCFA was conducted using full information maximum likelihood [FIML] estimator to account for missing values, which assumes that the variables are continuous and normally distributed. However, some argue that maximum likelihood estimators are less efficient in treating ordinal data due to nonnormality. As an additional analysis, we therefore re-estimated the MGCFA using the weighted least squares mean and variance adjusted estimator and recommended estimation procedures (Davidov et al., 2011; Wu & Estabrook, 2016). The results of the MGCFA using WLSMV were in line with the results using FIML, including the comparison of latent means. We therefore present here the results using FIML, and the results for WLSMV can be found in the Online Appendix 3.

[3] For reference, the unstandardized factor item intercepts for legal cynicism based on metric invariance model are presented in the Online Appendix 4.

[4] As a separate analysis, we estimated a latent variable for legal cynicism in Montevideo, and regressed legal cynicism onto the same set of social and developmental antecedents. Although the issue of measurement non-invariance makes direct comparisons difficult, the results are still of interest for understanding legal socialization processes. The results, similar to São Paulo and Zurich, show that low self-control had the strongest association with legal cynicism (see Online Appendix 5).

Table 1
Tests of measurement invariance of legal cynicism in São Paulo, Zurich, and Montevideo.

	Model fit comparisons	X^2 (df)	Comparison	RMSEA	CFI	ΔCFI
1	Configural model	64.27 (21)***		0.031	0.991	
2	Metric invariance	120.95 (31)***	1 v 2	0.037	0.982	0.009
3	Scalar invariance	1002.16 (41)***	2 v 3	0.106	0.805	0.177
4	Partial scalar invariance[a]	183.68 (33)***	2 v 4	0.047	0.969	0.013

Notes. Df = degrees of freedom; RMSEA = Root mean square error of approximation; CFI = comparative fit index; ***p < .001. FIML techniques were used to account for missing data.

[a] Partial invariance was evaluated by removing constraints on item intercepts one by one, until only two item intercepts remain constrained.

Table 2
Measurement invariance tests for legal cynicism comparing two cities.

	Model fit comparisons	X^2 (df)	Comparison	RMSEA	CFI	ΔCFI
São Paulo v. Zurich						
1	Configural model	32.83 (14)**		0.026	0.994	
2	Metric invariance	41.53 (19)***	1 v 2	0.024	0.993	0.001
3	Scalar invariance	245.73 (28)***	2 v 3	0.067	0.935	0.058
4	Partial scalar invariance[a,b]	64.36 (22)***	2 v 4	0.031	0.988	0.005
Montevideo v. Zurich						
1	Configural model	36.80 (16)***		0.030	0.992	
2	Metric invariance	79.94 (19)***	1 v 2	0.042	0.980	0.012
3	Scalar invariance	697.45 (24)***	2 v 3	0.124	0.775	0.205
4	Partial scalar invariance[a]	189.85 (20)***	2 v 4	0.068	0.943	0.037
Montevideo v. São Paulo						
1	Configural model	58.91 (14)***		0.036	0.987	
2	Metric invariance	94.49 (19)***	1 v 2	0.040	0.978	0.009
3	Scalar invariance	603.84 (24)***	2 v 3	0.100	0.832	0.146
4	Partial scalar invariance[a]	317.90 (20)***	2 v 4	0.078	0.914	0.064

Notes. Df = degrees of freedom; RMSEA = Root mean square error of approximation; CFI = comparative fit index; **p < .01; ***p < .001. FIML techniques were used to account for missing data.

[a] Partial invariance was evaluated by removing constraints on item intercepts one by one, until only two item intercepts remain constrained.

[b] Two item intercepts are allowed to vary ("There are no wrong or right ways to make money, only easy or hard ways" and "It's a great feeling when you break the rules and don't get caught").

Table 3
Structural equation model regression analysis of legal cynicism on social and individual characteristics in Zurich and São Paulo.

Variables	b	Zurich	β	b	São Paulo	β
		95% CI			95% CI	
Gender (1 = male)	−0.013	[-0.036,0.010]	−0.024	−0.01	[-0.025,0.006]	−0.021
Age	−0.003	[-0.033,0.028]	−0.004	0.006	[-0.005,0.018]	0.019
Parental education	−0.001	[-0.013,0.012]	−0.002			
Migrant background (1 = both migrant parents)	0.017	[-0.006,0.040]	0.031			
SES				−0.001	[-0.003,0.002]	−0.01
Ethnicity (1 = black)				−0.011	[-0.026,0.004]	−0.023
Parental supervision	−0.027**	[-0.047,-0.008]	−0.064	−0.011	[-0.025,0.002]	−0.031
Parental involvement	−0.022*	[-0.040,-0.003]	−0.053	−0.014*	[-0.025,-0.003]	−0.046
Deviant peer group (1 = yes)	0.056***	[0.026,0.087]	0.085	0.035***	[0.017,0.052]	0.071
Teacher-child bond	−0.007	[-0.026,0.011]	−0.018	−0.011	[-0.025,0.003]	−0.028
Low self-control	0.170***	[0.139,0.200]	0.279	0.180***	[0.162,0.198]	0.378
Morality	−0.046***	[-0.057,-0.034]	−0.203	−0.029***	[-0.035,-0.022]	−0.161
Deviant behavior	0.012***	[0.008,0.016]	0.148	0.008***	[0.005,0.011]	0.109
Police contact (1 = yes)	0.022	[-0.017,0.061]	0.024	0.023	[-0.008,0.054]	0.025
Police legitimacy	−0.035***	[-0.052,-0.018]	−0.094	−0.015**	[-0.025,-0.005]	−0.047
Constant	1.094***	[0.597,1.591]		0.807***	[0.614,1.000]	
N		1411			2680	
CD		0.402			0.327	

Notes. Police contact in Zurich reflects the prevalence of contacts in relation to deviant behavior and drug-related offences, and in São Paulo police contact reflects the prevalence of contacts for drug-related offences or other problems in general. FIML techniques were used to account for missing data. b = unstandardized regression coefficient; CI = confidence intervals; β = standardized regression coefficient; CD = coefficient of determination; *p < .05, **p < .01, ***p < .001.
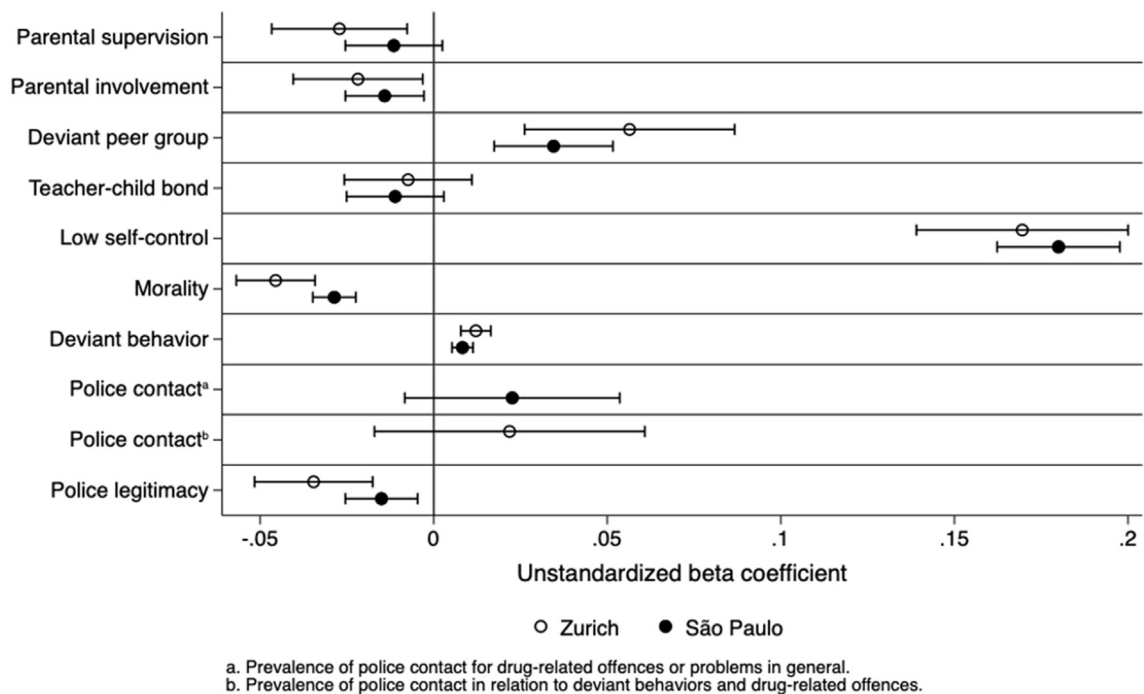
Fig. 2. Unstandardized beta coefficients and 95% confidence intervals for select antecedents of legal cynicism in Zurich and São Paulo.

Next, we regressed legal cynicism onto a series of socio-demographic, parental, peer, criminal justice, and individual antecedents. Table 3 displays the unstandardized and standardized regression results for each city, and Fig. 2 visually presents the unstandardized point estimates and 95% confidence intervals for the key social and individual correlates of legal cynicism (i.e. excluding socio-demographic background). Fig. 2 shows that the confidence intervals overlap for all relevant social and individual variables, indicating that the correlates of legal cynicism are remarkably similar across cities. Differences between coefficients were also examined using z-tests, as recommended by Paternoster et al. (1998).[5] With the exception of morality ($b_Z = -0.046$, $p < .001$, $b_{SP} = -0.029$, $p < .001$, $z = 2.55$), all coefficients were not significantly different across samples. Parental influences, here measured by parental supervision and involvement, have small negative associations with legal cynicism in both cities. However, only the coefficients for parental involvement are significant in both cities ($b_{SP} = -0.014$, $p < .05$; $b_Z = -0.022$, $p < .05$). Association with deviant peers is related to higher levels of legal cynicism ($b_{SP} = 0.035$, $p < .001$; $b_Z = 0.056$, $p < .001$). While this relationship is stronger in Zurich, the overlapping confidence intervals and z-test ($z = -1.24$) suggest that this does not reflect significant differences in effect size. While police contacts showed no direct association with legal cynicism, adolescents with more positive perceptions of police legitimacy had significantly lower levels of legal cynicism ($b_{SP} = -0.015$, $p < .001$; $b_Z = -0.035$, $p < .001$).[6] Perhaps most notably, low self-control exhibits the strongest standardized association with legal cynicism across cities ($\beta_{SP} = .378$, $b_{SP} = 0.180$, $p < .001$; $\beta_Z = 0.279$, $b_Z = 0.180$, $p < .001$), whereby adolescents with lower self-control are more cynical about the law.

6. Discussion

The goal of this paper was to compare the sources of legal cynicism in three very different contexts: São Paulo, Brazil, Zurich, Switzerland, and Montevideo, Uruguay. These cities reflect three different social and institutional contexts that can be used to evaluate the generalizability of legal socialization processes. Prior to analyses, this study also assessed to what extent the legal cynicism scale is a reliable tool for cross-cultural comparison. The results demonstrated metric invariance, but not scalar invariance in legal cynicism among adolescents in São Paulo, Zurich, and Montevideo. This means that while the conceptualization of legal cynicism is equivalent across contexts, there is evidence of differential response on certain items between all three cities.

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[5] Values greater or less than 1.96 reflect significant differences in the size of coefficient between samples. The formula for the z-test is derived from Paternoster et al. (1998, p.862): $z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$. Where b_n reflects the coefficient for a given explanatory variable, and SE_n reflects the standard error for the coefficients respectively.

[6] While we use the term "police legitimacy" to capture broad attitudes towards the police, an anonymous reviewer rightly pointed out that procedural justice is typically considered a predictor of police legitimacy (Tyler & Huo, 2002). As an additional robustness check, we therefore re-estimated the structural equation models using only a single item for procedural justice from the police legitimacy scale ("The police treat people with dignity and respect"). The results can be found in Online Appendix 6. The results remained the same.

Although partial scalar invariance for all three cities was bordering on an acceptable fit (Table 2), this required all but two items intercepts to be freely estimated. With only two items equal across groups, the reliability of estimating the factor means diminishes (Steenkamp & Baumgartner, 1998). Ideally, the majority of factor loadings and intercepts are invariant across groups, as it increases the validity of comparisons (i.e. latent means are based on more comparable items). Although studies have shown that partial invariance is sufficient for comparing latent means (Steinmetz, 2013), there is some debate about which techniques are most appropriate to determine partial invariance (Oberski, 2014; Vandenberg, 2002), while others have proposed alternative approaches to establishing measurement invariance (van de Schoot et al., 2013). Some point out that researchers are rarely able to establish measurement invariance, and argue that comparative or longitudinal surveys should be accompanied by qualitative interviews in order to fully understand why invariance may occur (Lugtig et al., 2012). Future research on legal cynicism should assess measurement invariance across different groups and contexts in order to identify problematic items and determine when and why systematic differences may occur.

Nevertheless, we were able to establish partial scalar invariance between São Paulo and Zurich and subsequently compare latent means across cities. Given that legal cynicism is often characterized as a dimension of institutional legitimacy (Kirk et al., 2012; Kirk & Papachristos, 2011; Sampson & Bartusch, 1998) that is shaped through the legal socialization process alongside perceptions of police legitimacy (Fagan & Tyler, 2005; Trinkner et al., 2020), we would expect that legal cynicism would be higher in São Paulo due to greater exposure to corruption, police misconduct, and structural inequality. The finding that the level of legal cynicism is significantly *higher* in Zurich challenges the notion that cynicism is rooted in contextual variables such as structural inequality and institutional misconduct.

Relatedly, our results show that the predictors of legal cynicism generally do not significantly differ across cities. Most notably, the three strongest effects are low self-control, morality, and deviant behavior, respectively, for both São Paulo and Zurich. Due to the comparative research design and use of comparable instruments, we can be relatively confident that individual dispositions towards rule-breaking, namely low self-control and morality, are generalizable risk factors for legal cynicism, as it is currently measured (see Sampson & Bartusch, 1998). More broadly, this has implications for how we understand the developmental origins of legal cynicism. Based on these results, legal cynicism may develop through processes more closely aligned with self-control or other cognitive factors that determine orientations and interpretations of rules and punishments (Reisig et al., 2011; Wolfe, 2011). Based on this framework, legal cynicism may develop much earlier in life through an interaction between genetic and socialization influences, and similar to low self-control may remain relatively rank-stable over time (Hay & Forrest, 2006; Van de Schoot, Schmidt, De Beuckelaer, Kimberley, & Zondervan-Zwijnenburg, 2015). Importantly, recent research suggests that self-control is still to some extent shaped by social influences throughout adolescence and early adulthood (Huijsmans et al., 2019; Meinert & Reinecke, 2018), and indeed we find that parental involvement also has a small direct effect on legal cynicism in both cities. However, more research is needed to understand how cynicism develops throughout the life course, and to what extent it is shaped by the same social and developmental processes as other psychosocial characteristics such as self-control.

Overall, our results suggest that current operationalizations of legal cynicism may not be rooted in social structural context and experiences with legal authorities, but rather reflect how individuals interpret legal boundaries and dispositions towards rule-breaking (Ameri et al., 2019; Augustyn & Ray, 2016; Nivette et al., 2020). One recurring issue is that legal cynicism does not appear to fit well within the socialization framework, as studies are increasingly discovering that experiences with the police and other social influences have a substantially weaker or no direct effect on legal cynicism (Fine & Cauffman, 2015; Kaiser & Reisig, 2019; Nivette et al., 2020; Trinkner et al., 2020). Researchers must reconsider how legal cynicism fits into models of legal socialization, and whether developmental models of self-control may help us understand the origins and nature of legal cynicism, as it is currently measured. The results further attest to systematic issues with the reliability of the legal cynicism scale derived from Sampson and Bartusch (1998), and suggests that researchers must critically consider the measurement of legal cynicism and its use in cross-cultural research (see e.g. Gifford & Reisig, 2019).

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.adolescence.2020.06.007.

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