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ABSTRACT

Purpose: The current study tested the links between routine activities and deviance across twenty-eight countries, thus, the potential generalizability of the routine activities framework.
Methods: Data were collected as part of the Second International Self-Report Delinquency Study (ISRD-2) from 28 cultures, from seventh, eighth, and ninth grade adolescents ($N = 66,859$). Routine activities were operationalized as family, peer, solitary, and community activities. Country-level predictors included unemployment rate, prison population, life expectancy, and educational attainment.
Results: Three-level, hierarchical linear modeling (individual, school, and country) was used to test both individual and country-level effects on deviance. Findings supported predictions by the routine activities framework, where routine activities explained 3.1% unique variance in deviance, above and beyond effects by background variables as well as low self-control. Models showed that the effects of family activities, solitary activities, and peer activities were stronger in countries with higher life expectancies. In addition, mean educational attainment increased the effect of solitary activities on deviance, while the effect of family activities on deviance was lower in countries with higher levels of unemployment.
Conclusions: The routine activities framework generalized across these 28 countries in how it explains deviance; some unique country-level effects were found that conditioned person-context links.

1. Introduction

The routine activities approach is a prominent theoretical framework (Cohen & Felson, 1979; Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996; Spano & Freilich, 2009) that has been widely used to explain deviant, delinquent, and criminal behaviors (Agnew, 2003; Anderson & Hughes, 2009; Augustyn & McGloin, 2013; Bossler, Holt, & May, 2012; Novak & Crawford, 2010). Different theoretical traditions, focused on both perpetration and victimization, underlie this framework (e.g., Cohen & Felson, 1979; Hindelang, Gottfredson, & Garofalo, 1978), however, the current study orients itself mostly by the work by Osgood et al. (1996).

Coined by Felson and Cohen (1980), the routine activities approach is rooted in human ecological theory. As such, it emphasizes the role of social and physical space along with associated activities in understanding norm-violating behaviors as opposed to exclusively focusing on individual inclinations or internal motivating factors (Cohen & Felson, 1979; Osgood et al., 1996). Relatedly, a similar notion has been articulated in the developmental literature as the concept of discretionary time (Bohnert, Richards, Kohl, & Randall, 2009), that is, the time adolescents spend outside structured settings such as school or work. It can be structured (e.g., team sports, neighborhood youth

groups, religious groups) or unstructured (e.g. hanging out with friends). Consistent with previous research, adolescents who spend their discretionary time in structured activities may experience more positive adjustment outcomes, including lower rates of externalizing problems, delinquency, aggression, substance use, and fewer criminal arrests (Bohnert et al., 2009; Bohnert & Garber, 2007; Darling, 2005; Mahoney, Harris, & Eccles, 2006; Wong, 2005).

Despite considerable evidence for the link between routine activities and crime or deviance, the generalizability of the framework remains unknown as most research was carried out in the United States, with some exceptions (e.g., Steketee, 2012; Mahoney & Stattin, 2000; Riley, 1987; Svensson & Oberwittler, 2010; Vazsonyi, Pickering, Belliston, Hessing, & Junger, 2002). Certainly, no previous effort has rigorously tested this question with a large enough sample, related to number of cultures or countries, along with the requisite multi-level analytic approach, to more closely assess potential person-context interactions. In addition, notwithstanding a clear recognition of the need for examining theories cross-culturally (Evans, Lagrange, & Willis, 1996; Wikström & Svensson, 2008) related to generalizability (Berry, Dasen, Saraswathi, Poortinga, & Pandey, 1997; Howard, Newman, & Pridemore, 2000), much work has focused on macro-level conditions (Mueller & Alder, 1996; Vazsonyi, 2003) or particular theoretical tests (Howard et al.,

2000; Stamatel, 2009; Vazsonyi, Pickering, Junger, & Hessing, 2001). The present study examined the extent to which the cultural context conditioned the link between routine activities (family, peer, solitary, and community activities) and adolescent deviance across 28 countries, using a hierarchical linear modeling approach, investigating the effects of a number of known macro or country-level differences.

2. Literature review

2.1. Routine activities theory

To address the rise in urban crime in the 1960s, Cohen and Felson (1979) developed the routine activities approach. Offering a macro-level perspective on crime, the authors linked patterns of offending and victimization to everyday patterns of social interactions. Closely aligned with perspectives of environmental criminology (e.g., Clarke, 1997), with its emphasis on the importance of opportunity in determining the distribution of crime across time and space, the routine activities theory has had successful practical applications in the prevention of crime (Felson, 2002).

According to Cohen and Felson (1979), the interaction between three factors, namely, a motivated offender, a suitable target, and the absence of a capable guardian, is what determines the increase in chances for crime and deviance. These factors largely constitute the opportunities for the offender (Felson & Clarke, 1998). The definition of routine activities by Cohen and Felson (1979) entails "any recurrent and prevalent activities which provide for basic population and individual needs, whatever their biological or cultural origin" (p. 593), and which may take place at home, at work or in other pursuits away from home. The organization of these activities, the daily routines of people, where they work, the friends they socialize with, their hobbies and leisure activities, and how they spend their time, strongly influence rates of crime (Felson & Cohen, 1980). A substantial amount of research has demonstrated that, consistent with the propositions from the routine activities framework, patterns of behaviors significantly affect the likelihood that motivated offenders will come into contact with suitable targets in the absence of capable guardians, accounting for observed differences in crime rates (Kennedy & Forde, 1990; Miethe, Stafford, & Long, 1987; Spano & Nagy, 2005; Tewksbury & Mustaine, 2003).

2.2. Routine activities and delinquent behavior

Osgood et al. (1996) extended this work on routine activities to an adolescent population. Their approach sought to understand not only criminal, but also delinquent behaviors. In addition, one of the main contributions that Osgood et al.'s (1996) elaboration has offered to research on adolescent delinquency is the focus on individual behaviors, indicating a shift from Cohen and Felson's routine activities theory, centered on examining aggregate crime rates. Based on the analysis of longitudinal data from approximately 1800 participants of the Monitoring the Future Study (ages 18 through 26), Osgood et al. (1996) found that unstructured activities were significantly associated with various deviant behaviors, showing a particularly strong effect on alcohol and marijuana use, compared to the effect on criminal behavior or dangerous driving. Inspired by Osgood et al. (1996), a number of applications of the routine activities approach to examining deviance among adolescents have followed. In this work, perhaps not surprisingly, peer influence has received particular attention (Hawdon, 1996; Osgood et al., 1996). Rather consistently, research has found that adolescents who engage in unstructured activities with peers, with no authority figures present, are more likely to engage in delinquent acts including substance abuse, vandalism, fighting, violence and property crime (Augustyn & McGloin, 2013; Bernasco, Bruinsma, Pauwels, & Weerman, 2013; Bernburg & Thorlindsson, 2001; Hoeben & Weerman, 2016; Novak & Crawford, 2010; Osgood et al., 1996). Furthermore, patterns of routine activities, including nights out, unstructured

socializing activities with peers, have been linked to higher frequencies of perpetration as well as victimization. This is often the case as such activities expose adolescents to high risk situations, which include alcohol use, for instance, and some forms of violence (Daday, Broidy, Crandall, & Sklar, 2005; Logan, Walker, Jordan, & Leukefeld, 2006; Nofziger & Kurtz, 2005; Schreck & Fisher, 2004). Furthermore, routine activities have been extended to include online activities, providing researchers with notable insights about the mechanisms of cyberbullying and online victimization among youth (Marcum, Higgins, & Ricketts, 2010; Mesch, 2009). These findings further demonstrate the role of routine activities in understanding variability of different forms of general deviance, albeit to varying degrees.

With growing research on routine activities and deviance, the problems, including theoretical indeterminacy (Meier & Miethe, 1993), or conceptual overlap with other theories (e.g., Hirschi, 1969), have become apparent. Theoretical indeterminacy, an issue particularly associated with cross-sectional studies, refers to the difficulty in determining a proper causal sequence between deviance and routine activities. As in many other studies reviewed thus far, the rationale for specifying an explanatory model of deviance informed by routine activities relies on a particular theory. The study tests how adolescents' routine activities are associated with self-reported deviance, however, the reverse is also possible. The model is also based on the assumption that routine activities are more stable, sustained activities that are characteristic of adolescents' daily lives, whereas deviant behaviors, on the other hand, as Gottfredson and Hirschi (1990) have pointed out, require little time or preparation. Thus, patterns of routine activities might coexist with risk for deviant behaviors.

Numerous studies have provided evidence supporting the key premises of the routine activities approach with regard to adolescent norm-violating behaviors, including positive links with spending time with peers and negative links with spending time with family, community (including sports), and solitary time (watching TV; Agnew & Petersen, 1989; Anderson & Hughes, 2009; Augustyn & McCloin, 2013; Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Bohnert et al., 2009; Dishion & McMahon, 1998; Dishion, Nelson, & Bullock, 2004; Fleming et al., 2008; Schreck & Fisher, 2004), including work conducted outside of the United States (Bernasco et al., 2013; Hoeben & Weerman, 2016; Mahoney & Stattin, 2000; Riley, 1987; Svensson & Oberwittler, 2010; Wikström & Svensson, 2008; Wong, 2005).

Findings from this work are consistent with the routine activities theoretical framework, across diverse samples. Youth from different socio-cultural backgrounds, in the United States and in other industrialized countries, seem to benefit from greater family involvement and more constrained peer activities. What appears missing from the current literature is a direct test of potential cross-cultural variation, if any, in how routine activities affect deviance, or in other words, does the person-context interaction have effects on this observed link. Only very few studies have tested this question, whether the routine activities framework generalizes across different cultural or national settings (cf., Steketee, 2012; Vazsonyi et al., 2002). In addition, a direct test of country-level effects on the link between routine activities and deviance remains entirely absent, although Vazsonyi, Schwartz, and Chen (2012) tested whether country level effects impacted individual-level deviant behaviors. At a macro or aggregate level, data provide some evidence of positive associations between countries' overall unemployment and income inequality, between income inequality and life expectancy, between mean years of schooling and life expectancy, between crime rates and life expectancy, as well as crime rates and national IQ (Altindag, 2012; De Vogli, Mistry, Gnesotto, & Cornia, 2005; Fajnzylber, Lederman, & Loayza, 2002; Rushton & Templer, 2009); however, it remains an empirical question whether these macro-level or contextual characteristics can explain variance in how adolescent involvement in structured or unstructured leisure activities affects deviant behaviors. It seems possible that negative social indicators, such as high unemployment, along with low life-expectancy, could be

indicative of an existing relative depravity of positive social interactions at the cultural level (Larson & Verma, 1999). Similarly, having a large prison population might signal either a greater problem of crimes or greater exposure to criminal behaviors, which in turn, would affect adolescent behaviors as well as their consideration of the future. However, all else being equal, and considering potentially generalizable features and goals of socialization processes, it is less likely that time spent with family or peers, for instance, could have substantially different effects on adolescent deviance, depending on the culture of residence. This is further explored in the following section.

2.3. Routine activities across cultures: a person-context analysis

One previous study (Vazsonyi et al., 2002) tested the relationship between routine activities and deviance in a sample of 7000 adolescents, ages 15–19 years, across four different countries, namely Hungary, the Netherlands, Switzerland, and the United States. Findings revealed that routine activities accounted for 18% of the variance explained in total deviance for males and 16% for females. Country added little explanatory power in deviance, with the exception of drug and alcohol use, leading the authors to conclude that "the routine activities perspective seems tenable cross-nationally" (p. 419). Next, the study by Steketee (2012) examined data from the second International Self-Report Study (ISRD-2) across 30 countries to investigate the impact of adolescents' lifestyle on delinquency. A more thorough review of this work is warranted to highlight some important distinctive features of the current effort based on the same data set.

For analytic purposes, Steketee (2012) grouped countries into six clusters (i.e., Anglo-Saxon, West-Europe, North-Europe, South-Europe, Post-social, Latin America). Findings provided evidence that free time spent alone was unrelated to serious offenses last year, while spending time with family appeared to be a significant protective factor (OR = 0.48). Spending time with 1–3 friends, as well as with larger group of friends, predicted a greater likelihood of serious offenses (ORs = 1.63 and 3.15, respectively). Furthermore, when youth spent > 3 h a day hanging out with friends in public places, this increased the odds of committing an offense more than six-fold (OR = 6.55).

The effects of a lifestyle, defined as an index of going out at night, hanging out with friends, time spent with family or time spent alone, were also examined. More specifically, never going out at night, hanging out with friends less than an hour, most of the free time spent with family, and not spending a lot of time with the group of friends in public places, each were assigned a score of −1, while going out at night once or twice, hanging out with friends for one to two hours, spending most time on one's own or with small group of friends were assigned a score of 0; finally, going out at night three times or more, three or more hours, hanging out with friends, and spending a lot of time in public places each was assigned a score of 1. Thus, the lifestyle scale scores ranged from −4 to 4, corresponding to a more family-centered versus peer-centered lifestyle, respectively. It was found that the lifestyle was positively associated with delinquency, across all national clusters.

The current study capitalizes on the same data set, but with distinct goals and questions, but also using quite different quantitative techniques, ones addressing the multiply nested data structure. The explicit goal was to empirically test routine activities theory and its importance for adolescent deviance across individual countries. The study does so by not only including routine activities that present risk, but also ones that may serve as protective factors against deviance, namely family activities, peer activities, solitary activities, and community activities. Unlike Steketee (2012), the present study also separately tested the effects of family activities as well as peer activities, community activities, and time spent alone, consistent with Osgood et al.'s (1996); see also Vazsonyi et al. (2002) original work. Again, the present study considered country-level variation, or potential person-context

interactions, and applied a multi-level modeling approach, treating each country as a unique unit of analysis as opposed to clustering them based on existing or presumed similarities. Finally, it tested known aggregate or macro country-level differences based on data from the Human Development Index by the United Nations, to better understand whether such differences can explain variation in individual-level behaviors, namely differences in the link between routine activities and deviance as well as deviance itself.

3. The current study

The current study sought to test the relationships between adolescent routine activities, operationalized as family activities, peer activities, solitary activities, and community activities, and deviance controlling for known correlates including sex, grade, SES, as well as low self-control. Importantly, it also examined the extent to which the cultural developmental context moderated or conditioned these links between routine activities and deviance across 28 countries, a person-context analysis. Whether or not these links would be moderated, was an empirical question that was tested in the current study as previous theoretical work provides little guidance on whether they should be similar or different across cultural contexts.

At the same time, Vazsonyi et al. (2002) found no direct evidence of cultural moderation, however, only based on four cultures; on the other hand, contextual and developmental frameworks would predict cultural effects (e.g., systemic or ecological theories). This is also echoed in previous writing in comparative or cross-cultural criminology, which included as a premise that crime varied across cultures, and thus, "that generalization from one to another [was] therefore dangerous" (Gottfredson & Hirschi, 1990, p. 172), and by implication, not appropriate to do. In part, this problem has been related to poor methods used in previous comparative research, something the current study overcomes. The sense was that "indeed every culture has its own crime and its unique causes of crime" (p. 173), thereby contributing to an inability of criminology to develop explanations of crime and deviance that can transcend cultural boundaries.

The current study challenges this view and seeks to test the extent to which the refined routine activities framework finds empirical support across cultures, despite the known differences in rates of deviance. In the spirit of rigorous science, it tests culture-level constructs with the intent of falsifying the idea or premise that there will be empirical support for the theoretical framework across cultures, that it can be generalized across countries, yes that perhaps it can even be considered universally applicable. These candidate constructs, both known to vary across cultures, but known to affect rates of crime and deviance based on previous work (e.g., Costantini, Meco, & Paradiso, 2017; Kovandzic & Vieraitis, 2006; Levitt, 1996; Machin, Marie, & Vujić, 2011), also related to availability of reliably measured and high quality data for all countries studied, included educational attainment (years in school), life expectancy, unemployment rate, and size of the prison population.

The underlying premise is person-context thinking, a term used by Vazsonyi, Cleveland, and Wiebe (2006) to test whether neighborhood effects conditioned the impulsivity-deviance link (subsequently, see also Vaughan, 2017; Vogel, 2016; Zimmerman, 2010; for related work on person-context effects, see Posick & Zimmerman, 2015), an analogous approach underlying rigorous empirical tests of specific theoretical propositions across different cultures (e.g., Vazsonyi et al., 2001). The former work has provided mostly mixed evidence, although based on the only nationally representative data set in this line of work, Vazsonyi et al. (2006) found no such effects. Fig. 1 provides a model of the proposed research questions, which also specifies schools as one level of analysis, not as a substantive research focus, but simply a modeling necessity related to the structure of how the data were collected across countries. In other words, schools were specified as varying at level 2 because ignoring this would systematically bias the observed estimates at both levels 1 and 3 of model tests.
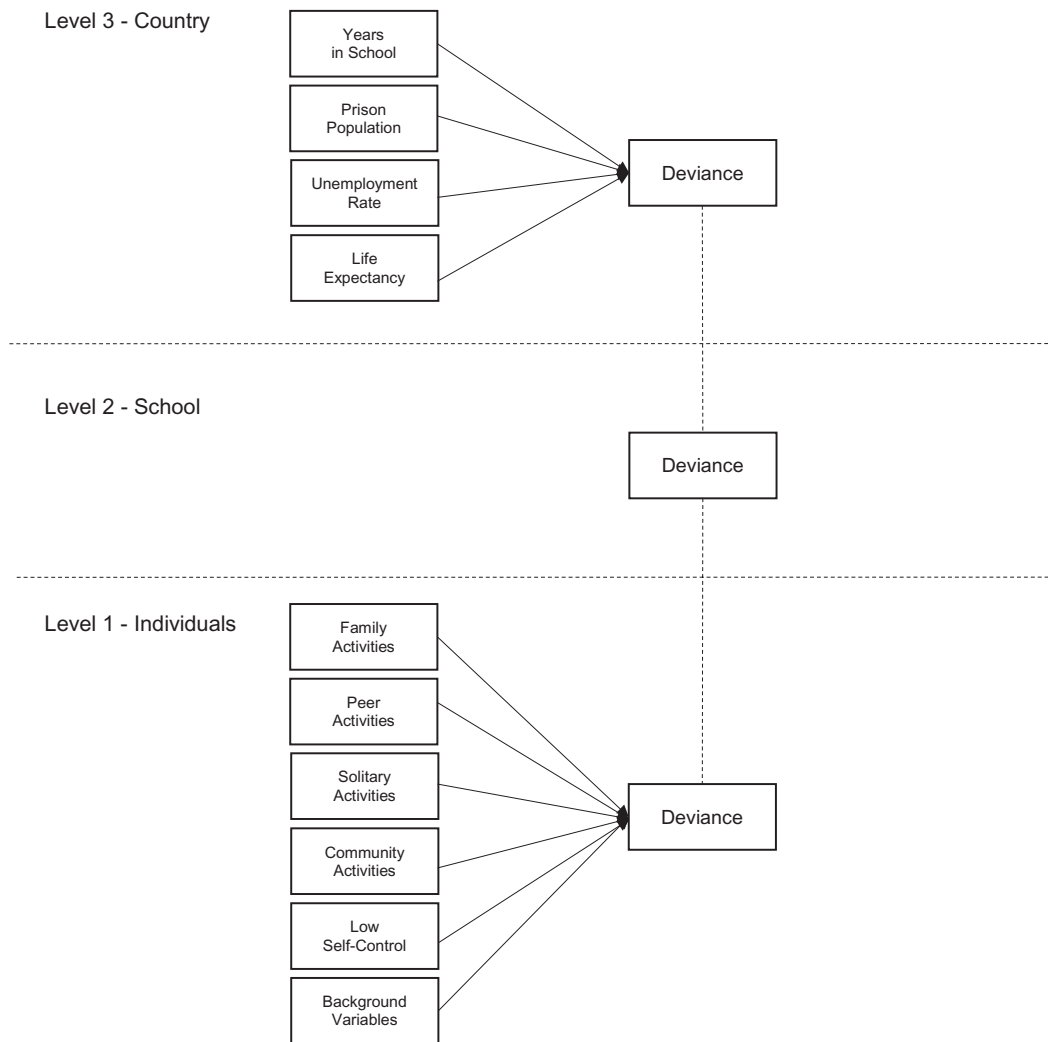
Fig. 1. Conceptual and analytic model of research questions. Background variables (controls) include age, sex, and SES.

The following study hypotheses were tested (Agnew & Petersen, 1989; Klein, 2005; Osgood et al., 1996; Vazsonyi et al., 2002), with a thorough test of country-level contextual effects:

1. Spending time with the family was expected to decrease the likelihood of engaging in deviant behaviors.
2. Spending time with peers, in unstructured, unsupervised activities was expected to increase the likelihood of engaging in deviant behaviors.
3. Consistent with previous research, spending time home alone was expected to decrease the likelihood of engaging in deviant behaviors.
4. Participating in structured community activities was expected to decrease the likelihood of engaging in deviant behaviors.

4. Method

4.1. Sample

Data are part of the Second International Self-Report Delinquency Study (ISRD-2) (Enzmann et al., 2015; Junger-Tas et al., 2012). The ISRD-2 is a cross-national study of delinquency and victimization of students from 7th to 12th grade classrooms (N = 73,396). The students were selected through national probability samples of classrooms across select towns and cities in 30 different countries, mainly in Europe, the United States, as well as Caribbean and South American countries. Due to the selection of predominantly city samples, the samples should not be considered nationally representative. A standard questionnaire and sampling protocol was employed by all countries, ensuring that each sample was obtained in a similar manner and that each participant received the same survey questions. Since the focus of this study was on differences among countries, we decided not to use dependent territories where the data were also collected - Aruba, and Antilles. In addition, the core sample of ISRD2 consists of 7th through 9th graders. Given that students from higher grades were assessed only in some of the countries (Italy, Poland, Spain, total n = 4889), we decided to only focus on 7th to 9th graders in order to have comparable samples across countries. This resulted in the final study sample of 28 countries with N = 66,080 respondents.

4.2. Measures

(See Appendix A for list of items)

4.2.1. Level 1

4.2.1.1. Age. Due to deidentified age variable in the data set, respondent's grade was chosen as a proxy for chronological age. Adolescents were asked to indicate their grade. Approximately equal number of participants was in the grades 7th, 8th, and 9th (32.9%, 33.3% and 33.8%, respectively).

Table 1
Sample sizes across 28 countries.

Country	N	%
Armenia	2044	2.9
Austria	2994	4.2
Belgium	2308	3.3
Bosnia and Herzegovina	2017	2.8
Cyprus	2310	3.3
Czech Republic	3245	4.6
Denmark	1376	1.9
Estonia	2611	3.7
Finland	1364	1.9
France	3022	4.3
Germany	3478	4.9
Hungary	2203	3.1
Iceland	591	0.8
Ireland	1563	2.2
Italy	7178	10.1
Lithuania	2175	3.1
Netherlands	2330	3.3
Norway	1694	2.4
Poland	2114	3.0
Portugal	2616	3.7
Russia	2313	3.3
Slovenia	2233	3.1
Spain	4144	5.8
Suriname	2399	3.4
Sweden	2282	3.2
Switzerland	3643	5.1
United States	2400	3.4
Venezuela	2322	3.3

4.2.1.2. Sex. Adolescents were asked to indicate their sex, either female (coded as 0) or male (coded as 1). Based on 65,923 valid responses, a roughly equal number of adolescents reported being male or female (50.5% and 49.5%, respectively).

4.2.1.3. Country. A country variable is part of the data set, based on which country the data were collected in. They included Armenia, Austria, Belgium, Bosnia-Herzegovina, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Lithuania, The Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Spain, Suriname, Sweden, Switzerland, United States (represented by four states - Illinois, Massachusetts, New Hampshire and Texas), and Venezuela. Sample sizes ranged from 591 (Iceland) to 5300 (Italy), with a 93% consisting of 1365 adolescents or more (see Table 1 for a complete distribution of sample sizes across countries).

4.2.1.4. Socioeconomic status (SES). SES was measured by indicators of maternal and paternal job stability as well as by possession of certain goods. First, maternal and paternal job stability scores were averaged to compute a parental job stability score (coded as "3" for mother/father having a permanent job or having a business, "2" as working sometimes, and "1" for not having a job/being retired/being ill or handicapped). Then, the sum of having an own room, family car, mobile phone, and a computer, was incorporated as another index of SES. Finally, both variables were standardized and their average was used to operationalize socio-economic status of the participant. The computed standardized SES score ranged from −3.61 to 0.7.

4.2.1.5. Low self-control (LSC). Twelve items from Grasmick et al. (1993) scale were used to measure low self-control. Response categories ranged from 1 (fully disagree) to 4 (fully agree). The items were averaged to compute the score of low self-control, ($M = 2.16$, $SD = 0.60$; $\alpha = 0.83$).

4.2.1.6. Routine activities. Adolescents rated 14 questions concerning their daily and weekly activities. These items were grouped into four areas, namely, Family Activities, Peer Activities, Solitary Activities, and

Community Activities; construct indices were computed by averaging across the items, which should not be considered scales with psychometric properties, but simply scores that assessed these adolescent behaviors.

4.2.1.7. Family activities. This construct was developed by combining two items: one asking about the frequency of leisure activities spent with a family (ranging from *almost never* – 1 to *more than once a week* – 6); second one refers to the frequency of having family dinners per week (ranging from *never* – 1 to *daily* – 8). The correlation between the items was $r = 0.25$, $p < .001$. These items were standardized and averaged to develop the score of family activities.

4.2.1.8. Peer activities. This construct was developed by combining several items asking about activities one does with friends. However, because some items in the survey asked about peer deviance (vandalism, drinking alcohol), we only selected those that were not assessing deviance; these included going to discos with friends, playing in band with friends, and spending time on computer games. They were rated on a scale ranging from *never* (0) to *always* (4). In addition, the following item was added "Outside school how much time do you spend on an average school day on each of these activities? – Hanging out with friends," rated as *none* (0) to *4 h or more* (5). These four items (three activities and hanging out with friends) were standardized and averaged to develop an index or score of peer activities.

4.2.1.9. Solitary activities. Similar to peer activities, this construct was developed by combining five types of activities the respondent does on an average school day, which included doing homework, reading a book, watching TV, reading magazines/comic books, and playing music instruments. Since these activities are not ordinal in a sense that endorsing more activities by the respondent necessarily translates into more proneness for solitary activities, we have analyzed these items via EFA to select those that were associated. Three items were selected to indicate preference for solitary activities: doing homework, reading books, and reading comic books/magazines. These were rated on a scale from *never* (0) to *always* (4), which were averaged to develop an index or score.

4.2.1.10. Community activities. This was measured by two items: one asking about how much time individuals spend on an average school day playing sports (ranging from *none* – 0 to *4 h and more* – 6), and one as an answer 'playing sports' to a question related to usual activities done when hanging out with friends (ranging from *never* – 0 to *always* – 4). The correlation between the items was $r = 0.58$, $p < .001$. These items were standardized and averaged to obtain the score of community activities.

4.2.1.11. Deviance. The ISRD-2 contains a number of self-reported questions about deviant, delinquent, and criminal behaviors, which are modeled after the core measurement of self-reported delinquency in the National Youth Survey (Elliott, Huizinga, & Ageton, 1985). The current investigation specified a total deviance score based on 11 items examining lifetime prevalence of norm-violating behaviors including vandalism, theft, or assault. The deviance score ranged from 0 to 11 ($M = 0.75$, $SD = 1.40$; $\alpha = 0.73$).

4.2.2. Level 3

At the country level, the following indicators for 2006 (United Nations Development Program, 2006) were selected: life expectancy, mean years in school, GDP per capita, prison population (per 100,000 people), and unemployment rate as a proportion of labor force. These specific country-level variables were selected because of their known links to crime and deviance. Although, life expectancy, education, and per capita income are commonly used as a composite measure of Human Development Index (HDI) to rank order countries, a decision

was made to include them as individual indicators to test their unique effects.

Based on previous work, the number of years spent in school has been found to be negatively associated with crime rates. The theoretical rationale for this association stems from the human capital framework where the greater the number of educated individuals, the higher the human capital and financial stability, thus, lower the crime rates (Lochner, 2004; Machin, Marie, & Vujić, 2011). Similarly, the association between unemployment and crime has been established by previous studies (Cantor & Land, 1985; Costantini et al., 2017). The crime rates were found to be negatively predicted by the size of the prison population (Devine, Sheley, & Smith, 1988; Levitt, 1996; Marvell & Moody, 1994). However, given non-significant findings for some previous work (Kovandzic & Vieraitis, 2006), the effects appear to be most prevalent among property crimes (Chiricos, 1987; also see Fougère, Kramarz, & Pouget, 2009). Similarly, GDP per capita was found to be negatively associated with more criminal behavior (e.g., Fajnzylber et al., 2002). Ultimately, we decided not to use GDP per capita as its correlations with other variables were deemed too high (too much overlap or redundancy), raising the issue of multicollinearity (GDP per capita with unemployment rate $r = -0.685, p < .001$, GDP per capita with life expectancy $r = 0.740, p < .001$). Although there has been a scarcity of studies using life expectancy as a predictor of country level crime, we decided to use this variable, as it is an important index of country development.

4.2.2.1. Years in school. The average number of years spent in school was 10.77 years ($SD = 1.69$), ranging from 7.3 years to 12.9.

4.2.2.2. Life expectancy. The average life expectancy across the 28 countries was 77.31 years ($SD = 3.84$), ranging from 66.3 years to 81.4 years.

4.2.2.3. Prison population. The average prison population was 151.20 prisoners per 100,000 people ($SD = 133.40$), ranging from 45 to 698.

4.2.2.4. Unemployment rate. The index of unemployment was computed as relative to labor force with an average of 8.35 ($SD = 4.31$), ranging from 2.5 to 25.9.

The descriptive statistics of all analysis variables are presented in Table 2.

4.3. Plan of analysis

Hierarchical linear modeling (HLM) with Mplus 7.4 was used to test the study hypotheses, where individuals (level-1) were nested within schools (level-2), which were nested within countries (level 3). Although the focus of the current study is on routine activities

Table 2
Descriptive statistics for study variables.

Variables	M	SD	Minimum	Maximum
Male	0.49	0.50	0	1
Grade	8.01	0.82	7	9
SES	0.03	0.77	−3.57	0.65
LSC	2.16	0.61	1	4
Deviance	0.75	1.40	0	11
Family activities	0.00	0.78	−2.50	1.06
Peer activities	0.00	0.59	−1.93	5.41
Solitary activities	2.35	0.78	1	6
Community activities	0.00	0.89	−1.50	1.69
Years in school	10.77	1.69	7.30	12.90
Life expectancy	77.31	3.87	66.30	81.40
Prison population (per 100,000 people)	151.20	133.40	45.00	698.00
Unemployment rate	8.35	4.31	2.50	25.90

predicting deviant behaviors across countries and the moderating effect of country-level variables, it was important to model nesting at the lower levels. This is why school effects were modeled as a second level to account for the non-independence of observations due to nesting of students in schools. However, no specific hypotheses regarding school variables were developed, thus, no predictor variables were tested, also related to the fact that it would be impossible other than using scaled up means from level 1 to identify appropriate ones. Model testing proceeded in four phases: unconstrained (null) model, random intercepts model, means as outcome model and intercepts and slopes as outcomes model (Woltman, Feldstain, MacKay, & Rocchi, 2012). The unconstrained (null) model was used to calculate the percentage of the variance in deviance that is attributable to school and country membership and what percentage is attributable to the individual level. Next, a random intercepts model tested the relationship between routine activity constructs at level 1 and deviance, accounting for country-level variability. A means as outcome model tested the main effects of level 3 predictors on deviance. Finally, a random intercepts and slopes model was estimated to test for interactions between the routine activities and level-3 predictors. All analyses were done using full information maximum likelihood with robust standard errors (MLR) for estimating missing data. To estimate missing data in random slopes model, a multilevel multiple imputation with 100 imputed datasets was estimated using Blimp (Enders, 2016). Level-1 variables were group-mean centered at level 2 (school cluster), while level-3 variables were grand-mean centered. Because the level-3 model included 28 units of analysis (countries), statistical power was limited. Based on extensive simulation analyses, Maas and Hox (2005) concluded that though the coefficient estimates are unbiased and correct with samples around 30, as is the case in the current study; however, the standard errors are underestimated or estimated too small, by approximately 15%, leading to a noncoverage rate of about 8.9% instead of the customary 5%. Practically, this meant that some of the SE estimates in our model tests would not reach significance because of this, but still might be substantively important, despite non-significance; in effect, analysis findings were overly conservative related to significance tests. We also decided to test level-3 predictors one by one to determine their unique effect. Finally, predictors were entered all at once in the final model test.

5. Results

Mean levels of deviance across all countries studied are shown in Fig. 2. As illustrated, countries with a relatively smaller mean deviance score include Bosnia and Herzegovina, Cyprus, Portugal, and Russia, whereas Ireland, Denmark, France, and Germany, represent countries with a relatively larger mean deviance score.

Prior to the main analysis results, the unconditional model indicated that there was a sizeable amount of variance at the higher level of analysis to require the use of HLM. In total, 90.7% of variance in deviance concentrated in individual level variation, suggesting that 9.3% of variance in deviance was due to higher-level nesting. Particularly, the ICC value of 0.059 at the school level suggested that 5.9% of variance in deviance was accounted for by the nesting in schools; the ICC value for countries was 0.034, showing that an additional 3.4% of variance was accounted for by nesting of individuals in countries. Fig. 3 presents the size of the effects of each routine activity on deviance across study countries; it shows that the effects were quite consistent in direction and magnitude, but that there were also some slight differences.

Table 3 shows the results from the three-level models with fixed effects. At the individual level, all predictors were statistically significant at alpha = 0.05 level. Respondent's grade (proxy of age), sex (being a male) and low self-control were positively associated with a deviance score. Unexpectedly, SES was not significantly associated with deviance, $β = -0.007, p = .233$. As hypothesized, family activities
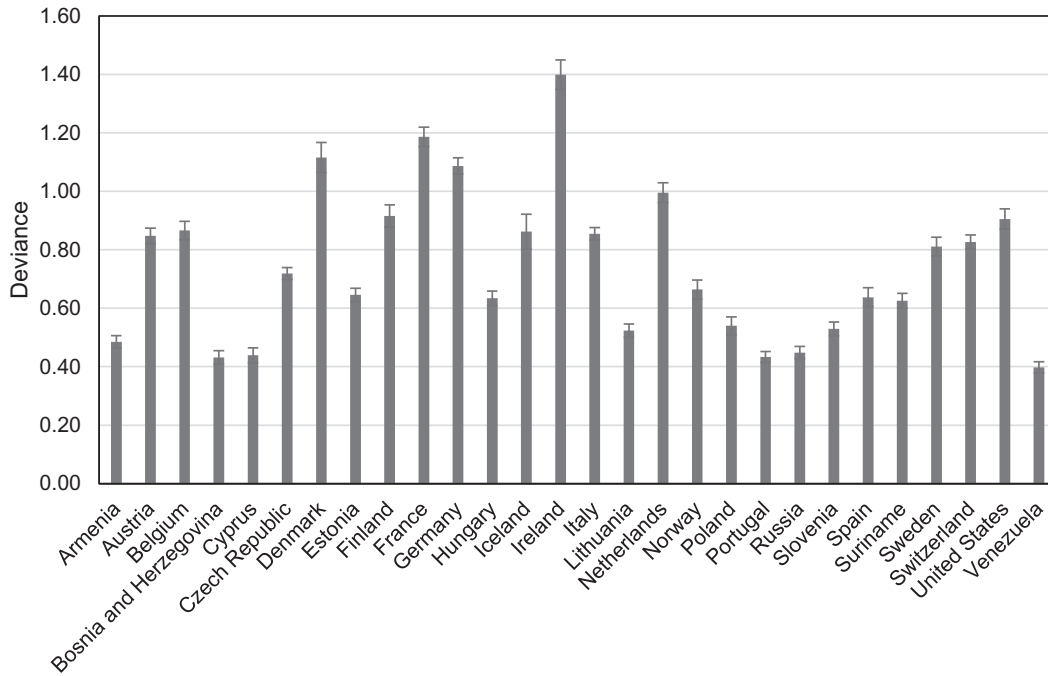
Fig. 2. Mean deviance levels by country.

negatively predicted deviance score, β = −0.098, *p* < .001. Similarly, solitary activities were negatively associated with a deviance score, β = −0.079, *p* < .001, while community activities were positively associated, β = 0.025, *p* < .001. Consistent with the research hypothesis, peer activities were positively associated with a deviance score, β = 0.122, *p* < .001.

Turning to country-level predictors, years in school was a significant positive predictor of deviance, β = 0.307, *p* = .021. Neither country prison population (β = 0.020, *p* = .884), nor rate of unemployment (β = −0.159, *p* = .173) were significant predictors. However, country

life expectancy (β = 0.475, *p* = .001) emerged as a significant country-level predictor of individual deviance. Testing the level-3 predictors separately, the analyses showed that years in school, life expectancy, and unemployment rate were each significant predictors of deviance (β = −0.433, *p* < .001). However, country prison population was not significant even when entered as the sole predictor. Because unemployment rate is the only variable that differs when tested uniquely versus in the full model with other predictors, a decision was made to build the level-3 model by adding other country-level variables to unemployment rate. After adding prison population and years in school,
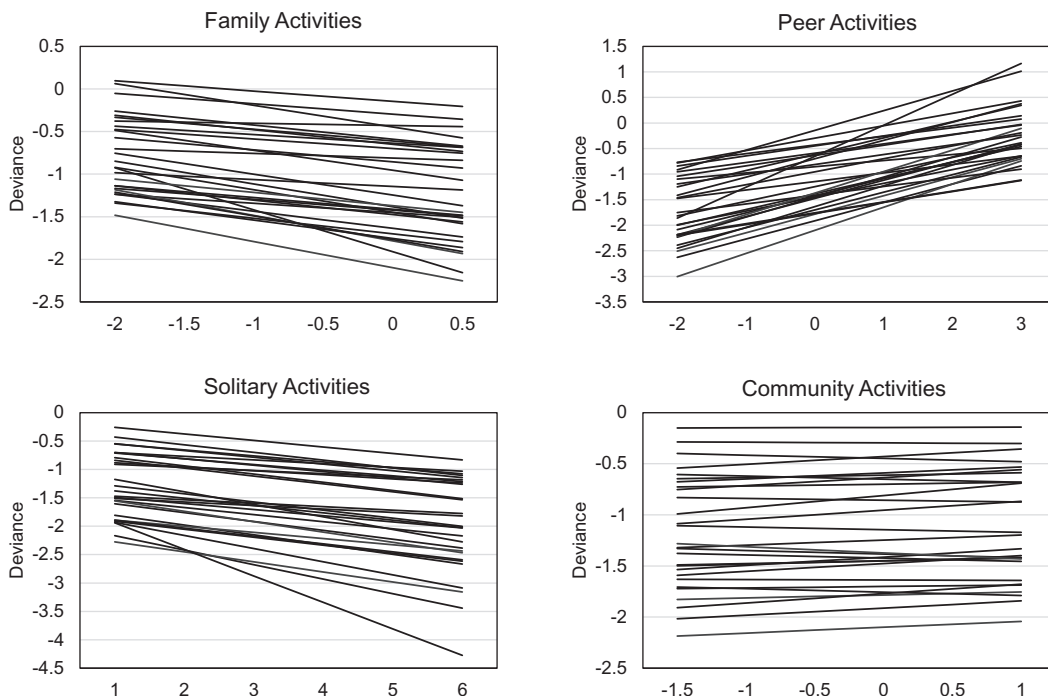

Fig. 3. The effect of different types of routine activities on levels of deviance controlling for other variables across countries. *Note.* Family activities, peer activities, and community activities were standardized.

Table 3
Standardized fixed effects of level-1 and level-3 predictors.

Variables	Coefficient	SE	p
Level 1 – individual level			
Grade	0.028	0.006	< 0.001
Male	0.109	0.010	< 0.001
SES	−0.007	0.006	0.233
Low self-control	0.308	0.012	< 0.001
Family activities	−0.098	0.005	< 0.001
Peer activities	0.122	0.007	< 0.001
Solitary activities	−0.079	0.005	< 0.001
Community activities	0.025	0.005	0.001
R^2	0.190	0.011	< 0.001
Level 3 – country level			
Average years in school	0.307	0.133	0.021
Prison population	0.020	0.139	0.884
Unemployment rate	−0.159	0.117	0.173
Life expectancy	0.475	0.146	0.001
R^2	0.468	0.131	< 0.001

unemployment rate remained statistically significant ($p = .008$). However, unemployment rate became non-significant once life expectancy was added to the model (both correlated at $r = −0.313$, $p < .001$).

The effect sizes for the two models indicated that 19% of the deviance score was explained by a set of level-1 predictors tested in a random intercepts model, whereas 46.8% of explained variance at level 3 was explained by contextual indicators. Consistent with the research focus, we singled out the variance explained by routine activities variables. Based on the comparison of two random intercepts models, it was found that routine activities collectively provided 3.1% of explained variance in deviance uniquely from other predictors.

Finally, a random intercepts and slopes model was tested. First, level-1 predictors were tested for random variation across countries. Family activities, peer activities, and solitary activities had significant random variation across countries. For this reason, these slopes were regressed on level-3 predictors. The random slopes were also allowed to covary with deviance. Table 4 shows results from these analyses. The results showed that the association between family activities and deviance was larger ($b = −0.016$, $p = .008$; this interaction is shown in Fig. 4) in countries with higher life expectancy, but smaller ($b = 0.006$, $p = .008$) as the country unemployment rate increases. The association between peer activities and deviance was larger in countries with higher life expectancy ($b = 0.013$, $p = .027$). The effect of solitary activities as protective against deviance was larger in countries with higher rates of school education ($b = −0.020$, $p = .037$) and in countries with higher life expectancy ($b = −0.009$, $p = .009$). No significant covariance was found between the slope of deviance and the level-1 random slopes.

Table 4
Random effects model: country-level variables regressed on level-1 variables.

Slopes	Predictors	Coefficient	SE	p-Value
Family activities	Average years in school	−0.009	0.010	0.344
	Prison population	< 0.001	0.001	0.740
	Unemployment rate	0.006	0.002	0.008
	Life expectancy	−0.016	0.004	< 0.001
Peer activities	Average years in school	0.015	0.016	0.350
	Prison population	< 0.001	0.001	0.126
	Unemployment rate	−0.005	0.004	0.272
	Life expectancy	0.013	0.006	0.027
Solitary activities	Average years in school	−0.020	0.010	0.037
	Prison population	< 0.001	0.001	0.650
	Unemployment rate	−0.002	0.003	0.482
	Life expectancy	−0.009	0.004	0.009

6. Discussion

The present study highlights the significance of various routine activities for understanding deviance among adolescents. Results from this large cross-national study further support a differential effect of family as opposed to peer activities, or solitary and community activities. Simultaneously testing all four types of routine activities while controlling for a known correlate of deviance, low self-control (Gottfredson & Hirschi, 1990; Pratt & Cullen, 2000; Vazsonyi, Mikuška, & Kelley, 2017) as well as other individual level predictors, including sex, SES, and age, the present analysis provides further validation of the routine activities theory and its use. Even more notable was incorporating country-level predictors, which considerably extended our understanding of the routine activities-deviance links, considered from a broader contextual perspective.

Consistent with our hypotheses and previous research (Osgood et al., 1996; Vazsonyi et al., 2002), the effects of routine activities on deviance were found to be significant and in the expected direction. Family activities as well as solitary and community activities negatively predicted a deviance score. Among them, family activities appeared to be the strongest. Expectedly, peer activities positively predicted deviance score. The present findings are also consistent with the previous studies (Posick & Rocque, 2015; Steketee, 2012; Wikström & Butterworth, 2006) according to which more peer-centered and less family-centered youths are more likely to be involved in deviant behavior. Overall, as indicated above, routine activities explained 3.1% of unique variance in deviance, above and beyond background variables as well as low self-control. This finding is consistent with Agnew and Petersen's (1989) remark that routine activities do deserve researchers' attention when designing the predictive models of deviance, even though leisure variables explained about 6% of the variance. At the same time, the amount of variance is quite modest, also related to low reliability of study variables, which attenuates observed links.

At the country level, the average years spent in school and higher life expectancy were both positive predictors of deviance, both indicators of overall greater country development. Moreover, when tested separately, unemployment rate was also a significant negative predictor of deviance. Due to limited country-level sample size, it is possible that this finding did not persist in the final model test, when all country level predictors were added to the model.

A key contribution of the present study to existing research is the examination of country-level effects on the level of deviance as well as the associations between routine activities and deviance. A country's life expectancy significantly conditioned the effect of family, peer, and solitary activities on deviance, indicating that in countries with higher life expectancy, the role of family, peers, as well as solitary activities become more pronounced, positive in the case of family and solitary acivities and negative in the case of peers. Life expectancy is an indicator of socio-economic stability, perhaps of affluence; thus, it appears that routine activities are more impactful or have a larger effect in such societies. The answer to why this is so might lie in understanding weaker effects in less affluent societies, where one could argue that there exists less social organization, fewer services designed to support well-being of youth and families, thereby rendering how youth spend their time less important. However, it should be noted that the direction of associations between routine activities and deviance remained entirely consistent notwithstanding variation in other country-level predictors. Interestingly, years in school that positively conditioned the effect of solitary activities on deviance, did not significantly affect the associations between family activities and deviance or between peer activities and deviance.

The observation that the effects of routine activities seem to be stronger in more developed countries deserves some further elaboration. As indicated, less affluent societies might be more disorganized, thus, adolescents might experiences more social problems, thereby also naturally limiting the repertoire of the routine activities in which they
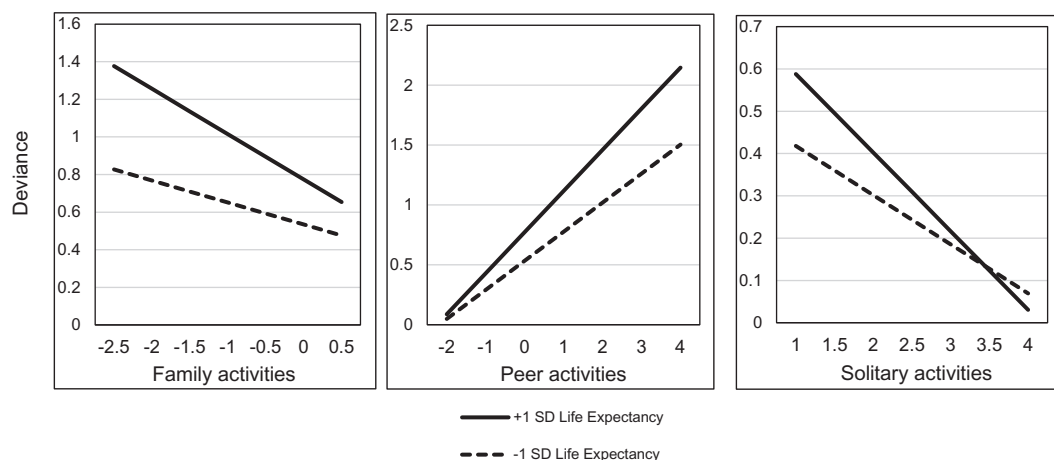
Fig. 4. Change in slope of different types of routine activities predicting deviance as a function of country life expectancy; plotted are slopes for $+$-1 *SD* of life expectancy. *Note.* Family activities and peer activities were standardized.

engage and vice versa. In fact, Bennett's (1991) study, which specified a macro-structural model that tested the cross-national variation in the routine activities-crime relationship based on 25-year archival data, concluded that the approach did not seem equally appropriate for all social structures. Rather, it requires a social structure with a specific set of characteristics, among them, "a highly industrialized society with a high level of inequality" (p. 158). Consistent with Bennet's insight, perhaps it should not be surprising that the approach "appears to apply best to social structures very similar to those in which activity-approach research has been conducted, such as the United Kingdom, the Netherlands, and the United States" (p. 159).

6.1. Limitations

The major limitation of the study is related to psychometric properties of some of the predictors. Given the scope of the ISRD-2 data collection, it could not include many existing and validated measures. As such, our conceptualization of routine activities was severely limited by the available items and is only a rough approximation or index of the actual behavior. This might also explain the very modest, yet unique, proportion of variance in deviance explained by routine activities in this study.

Related to this, another limitation concerns the measurement of community activities. Even though our operationalization of it based on involvement in sports is consistent with a common definition of community, only focusing on one type of activity assumes that a wide range of community activities reflective of a variety of interests and specificities regarding gender, ethnicity, and other characteristics, is missing. Furthermore, as routine activities differ in their content, meaning, and level of commitment, it would be important to extend the number of examined routine activities, for instance, to participation in volunteering or religious activities.

In addition, a conceptual difficulty pertains to the participation in family activities due to a natural complexity of understanding family relationships. Namely, family activities per se do not exclude the possibility of also entailing emotional ties with family members, in other words, the role of social bonding (Hirschi, 1969) is likely to be found within the given operationalization. This is not necessarily a limitation though, rather an attempt to recognize a possible intersection of concepts from different theories. In fact, some authors (e.g., Bernburg & Thorlindsson, 2001) have suggested that the consideration of the indicators of social bonds (i.e., attachment to family and school) may further clarify the predictive models of deviance by routine activities. However, it should be noted that even though involvement in the family activities and attachment are positively associated with each other, these two constructs are differentiable and can uniquely predict

delinquency (Wong, 2005).

As indicated by variance partitioning, pursuing school level variation substantiated with good research questions might further our understanding of deviance and the theoretical implications of routine activities. Particularly, if we consider that peers might as well be friends from the same school, a competing argument from social learning theory might be advanced (Akers, 1998) and thus, examined. As for example, in a study of 4358 eighth graders across 36 schools (Osgood & Anderson, 2004), the authors conceptualized and tested contextual effects of unstructured activities with peers as well as of parental monitoring. They found a strong effect of both individual and aggregate unstructured activities on deviance, and remarkably, a strong contextual effect of parental monitoring on unstructured socializing. However, the present study primarily focused on variations across countries in routine activities and deviance and whether country-level indicators could explain these.

As is true for other cross-sectional studies, the present analysis bears the same limitations, such as uncertainty in directionality of the effect, and relatedly, inability to include important variables, which are more likely to be successfully addressed within experimental or longitudinal designs. Firstly, we cannot argue about causality simply because of various possibilities of relating routine activities to deviance. It is likely the same time point of measuring both might as well mean that deviance is what predicts a given pattern of routine activities rather than the opposite. Similarly, some forms of routine activities and deviance can be an expression of one underlying construct, explaining the examined relationships between them. Secondly, it is impossible to include all relevant variables at one point of time in individual's life. Events and developmental changes do require longitudinal assessment to fully understand the phenomenon. Clearly, longitudinal studies (e.g., Dishion et al., 2004; Fleming et al., 2008) allow more elaborate investigation of reciprocal associations of deviance and routine activities. Finally, again, related to generalizability, is that the majority of ISRD-2 samples were city-based, and therefore not nationally representative of each country.

In conclusion, the present study makes a novel contribution to the literature on routine activities and deviance, by illustrating its applicability of the routine activities framework across cultures, but also by finding some salient country-level effects on the observed routine activities-deviance links, providing some modest evidence in support of the importance of person-context effects.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jcrimjus.2018.03.005.

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