A CROSS – NATIONAL STUDY OF YOUTH OFFENDING: TOWARD AN INTEGRATION OF INDIVIDUAL AND MACRO THEORY OF CRIME

A dissertation presented

By

Myunghoon Roh

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ABSTRACT OF DISSERTATION

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ABSTRACT

While testing criminological theories and concepts in cross-national studies provides a chance to establish the scientific generalizability of specific causal mechanisms across different countries, comparative criminologists must overcome both theoretical and methodological challenges while conducting their research. Given that most criminological theories and measurement instruments are derived from the United States and Western cultural settings, critical issues arise when criminologists are conducting cross-national research including non-Western countries. Cross-national research should use instruments that measure the same psychometric construct in all countries in the same manner; therefore, this dissertation tests the measurement invariance of the indicators as an important first step prior to testing of the generalizability of a set of hypotheses across a number of national contexts. The dissertation attempts to integrate aspects of three criminological theories – social bonding theory, lifestyle/routine activities theory, and self-control theory – and to test its cross-national generalizability. Specifically, the mediating and moderating effects of social bonding and routine activities on delinquency are examined. Moreover, drawing from Institutional Anomie theory, this study examines the moderating effect of country-level social contextual characteristics of economic dominance on the relationship between individuals’ predictors and their violent and property criminal offending. The data are 44,221 7th, 8th and 9th graders from 24 countries collected by the second wave of International Self-Report Delinquency Study (ISRD2). The findings from measurement invariance testing confirmed partial metric invariance among responses to the scales measuring attachment to significant others, delinquent peers, and
low self-control. Consistent with earlier analyses of the ISRD2 data (Marshall & Enzmamn 2012), the hypotheses derived from social bonding, self-control theory, and routine activity theory found support among the sample. On the other hand, the expected mediating variables did not mediate between adolescents' level of low self-control and violent and property criminal offending. Examination of the moderating effect of country-level economic institutions [i.e. Gini index and the index of economic freedom (developed by the Heritage Foundation)] provides some support for the implications of Institutional Anomie Theory. The results reported that adolescents' low self-control, attachment to parents, school, and neighborhood, and delinquent peers had significant impact on their delinquent offending. In addition, the effect of low self-control on violent criminal offending was stronger among adolescents living in countries with higher level of economic dominance than the group of countries with a lower level of economic dominance. On the other hand, the effect of attachment to parents on violent criminal offending is stronger among adolescents living in countries with lower level of economic dominance. The findings indicate that measurement invariance testing, theory integration, and attempts to integrate micro- and macro-level theories are important to advance valid comparative criminological research and theory development.
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CHAPTER I
INTRODUCTION

Contemporary criminology theoretical frameworks, as well as the metrics for evaluating them, were developed and tested mainly within Western cultural settings, especially the United States (Karstedt, 2001). Gottfredson and Hirschi’s (1990) self-control theory and Grasmick et al’s (1993) self-control scale are a case in point. Fields outside of criminology have more readily embraced transnational and comparative methods. For instance, the cross-cultural approach is drawn originally from the field of sociology and cultural anthropology. Durkheim’s statement illustrates this point:

“Comparative sociology is not a particular branch of sociology; it is sociology itself”

(Durkheim, 1938, 1951: 139)

The recent globalization of political, social, economic, and technological issues as well as the increasing recognition that crime is a worldwide phenomenon have led criminologists to focus more on the cross-cultural approach. According to Bennett’s (2004) presidential address, the events of September 11th dramatically increased interest in comparative criminology and criminal justice. In addition, Dammer, Riechel, & He (2005) suggested several factors which escalated interest in the cross-cultural approach: European Union’s eastward expansion, the modernization of economy, opening of previously restricted -borders, and widespread transcontinental mobility.

The goal of comparative criminology is to test the scientific generalizability of the causal mechanism purposed by criminology theories and conceptualizations (Miller, Jennings, Alvarez-Rivera, & Lanza-Kaduce, 2009; Botchkovar, Tittle, & Antonaccio, 2009).
Testing theoretical concepts through a cross-cultural approach allows criminologists to compare historical, political, social, economic, and cultural influences on crime across different countries (Vazsonyi, Pickering, Junger, & Hessing, 2001; Meneses & Akers, 2011). However, the mostly Western origin of contemporary criminological perspectives and scales has placed comparative criminologists in a difficult position.

Given that most of contemporary criminological theories are derived from the United States and Western cultural settings, critical issues arise when criminologists conduct cross-cultural research that include non-Western countries. Because of the field’s focus on the West, we want to make sure that we develop theories that are also applicable to non-Western countries. Not only do we need to test the cross-national generalizability and applicability of (individual level) crime theories, but we also need to see if and how country-level contextual factors are related to individuals’ crime and deviant behavior across different countries. This calls for an integrated perspective on crime for cross-cultural criminological research, including both individual and macro-level variables.

Some contemporary criminological theories have been tested cross-nationally. First, Gottfredson and Hirschi’s (1990) general theory of crime proposed that the lower the individual’s self-control, the higher the likelihood s/he might engage in criminal or ‘analogous’ behaviors. Specifically, they argued that their theory is ‘culture free’, and could thus predict any criminal or deviant behavior regardless of cultural and racial makeup. They claimed, “Cultural variability is not important in the causation of crime, and the general theory of crime can encompass the reality of cross-cultural differences in crime rates” (1990:174-175). Prior empirical research that tested the relationship between self-
control theory and crime and deviant behaviors has supported Gottfredson and Hirschi’s propositions in different cultural and national groups across countries (Vazsonyi, Pickering, Junger, & Hessing, 2001; Vazsonyi, Wittekind, Belliston, & van Loh, 2004; Junger-Tas et al., 2012).

Secondly, Hirschi’s (1969) social bonding theory also has been tested across different cultural settings. Hirschi (1969) emphasized the significance of an individual’s social bonding to others in order to answer the question; “Why don’t we commit crime?” instead of “Why do we commit crime?” He believed that individuals’ level of social bonding acts as a control mechanism. Given that individuals’ magnitude of social bonding is not equally strong among all people, there are differences in involvement in crime and deviant behavior. Several subsequent studies attempted to generalize the central theoretical propositions of the theory across different cultural settings (Le Blanc, 1994; Junger-Tas et al., 2012), with fairly and consistently support. However, some of these studies have suggested the need for revisions to the original bonding theory and to integrate it with other theories (Elliott, Huizinga, & Ageton, 1985; Sampson & Laub, 1993; Thornberry, 1987).

Routine activities theory (Cohen & Felson, 1979) has also been tested by cross-cultural research. The core contention of routine activity theory is that three different theoretical elements must be present for crime to occur: motivated offenders, suitable targets, and an absence of capable guardianship (Cohen & Felson, 1979). Routine activity theory’s suitability for cross-national research has been based on Karstedt’s (2001) argument that all three components of routine activities theory’s causal mechanism are determined by cultural values and practices. She argued offenders’ motivational pattern,
targets’ daily routines, and practices of formal and informal control are profoundly embedded in each society’s cultural background (Karstedt, 2001). Thus, the theory’s capability for allowing cultural variability allows testing it in cross-cultural settings, in order to explain variations in crime and deviant behavior (Bennett, 1991; Van Dijk & Mayhew, 1993; Gartner & Parker, 1990; Stamatel, 2009).

Finally, derived from both the theoretical roots of Durkheim and Merton’s (1938) theory of anomie, Messner and Rosenfeld (1997, 2009) developed Institutional Anomie Theory. The theory proposes that institutional imbalance (i.e. the dominance of the economy over other institutions) causes crime (Messner & Rosenfeld, 1997, 2009). They explained that the US market economy emphasizes monetary success, individual achievement, and competitive individualism, which then penetrates individual social institutions, such as family, education, religion, and polity (Messner & Rosenfeld, 1997, 2009). The market economy creates an institutional imbalance undermining traditional non-economic functions, which, in turn, causes crime. Although the Institutional Anomie Theory was developed for the United States, a number of criminologists have tested whether this theory can explain crime behavior across countries (Karstedt & Farrall, 2006; Messner & Rosenfeld, 1997, 2007; Savolainen, 2000; Jensen, 2002; Cao, 2004; Zhao & Cao, 2010).

According to Gottfredson and Hirschi (1990), crime occurs when individuals with weak self-control encounter opportunities for gratifying one’s own needs or desires. Within this framework, crime depends upon two conditions. The first condition is the internal characteristics of the individual (i.e. low self-control). And the second one is a characteristic of social situations (i.e. opportunities) (Tittle, 1995). In other words, self-control theory
implies that interaction between weak self-control and opportunities embedded in the situations produces criminal acts. Studies using this theory seek to understand whether and how cultural variations, age, gender, and race make a difference in the causal processes involved in the interaction of self-control and opportunities for crime (Tittle, 1995).

Since crime is a complex human behavior, any single theoretical proposition will fail to account for all factors that are involved. Therefore, the three criminological theories briefly discussed above (self-control theory, social bonding theory, and routine activities theory) are considered simultaneously in the current dissertation in order to explain variation in individual, self-reported delinquency. This approach is consistent with much current criminological research which tends to draw variables from different conceptual frameworks (see for example Elliott et al. 1985, Bernard, Vold, Snipes, & Gerould, 2010).

Additionally, the resulting integrated theoretical framework is tested across countries using macro-level concepts derived from Institutional Anomie Theory. This study will enable us to better understand how the proposed integrated individual-level theoretical framework operates under different macro-level conditions.

To obtain meaningful comparison across different cultural settings, this study normalizes the instruments and scales intended to measure the theoretical constructs across different countries. Comparative criminologists often assume that their instruments and scales are equivalent and their obtained results are comparable across countries. Consequently, focusing on the differences of average scores reflecting the theoretical constructs among the countries in the study, comparative criminologists often conclude that there are substantive cross-cultural similarities or differences in the study without a full consideration of whether these results are methodological artifacts (Junger-Tas et al,
This dissertation puts these assumptions to the test by exploring the cultural invariance of standardized measures.

Comparative criminologists need to consider the methodological challenges along with the theoretical challenges for cross-cultural analyses in the field of criminology. It is possible that due to the origin of theoretical frameworks from a single cultural setting (i.e. United States) the same set of questions in the survey might have different meanings in different cultures or countries. Thus, the validity of the results from cross-cultural studies without ensuring for invariance of measurements is weak (Rodríguez, Pérez-Santiago, & Birkbeck, 2015). Therefore, measurement invariance testing is a critical issue for meaningful comparison across different countries. When researchers are comparing groups across different countries, it needs to be ascertained whether they are measuring the same psychometric constructs in all groups in the same manner or not. Unfortunately, the issues of measurement invariance have largely been neglected in previous cross-cultural empirical criminology research. However, measurement invariance testing has received increasing attention in and scholars have begun to overcome the methodological challenges cross-cultural research entails (e.g. Ren, Zhao, He, Marshall, Zhang, & Zhao, 2015).

This study will also attempt to address another major issue within the field—the need to simultaneously consider methodological and theoretical issues. Thus far, comparative criminologists tend to separate concern with methodological and theoretical issues and questions. There have been three different types of empirical cross-national criminological studies relevant to the current dissertation. First, several empirical studies integrated existing individual-level criminological theories and tested them cross-nationally
(Esbensen, 2005; Meneses & Akers, 2011; Winfree, 2012). Second, studies have linked macro-level and micro-level theoretical factors across different cultural settings (Cao, Zhao, Ren, & Zhao, 2010; Kim, Akers, & Yun, 2013). Combining national contextual factors and personal traits, these studies attempted to examine criminal behavior more comprehensively compared to the first type of study. Finally, focusing only on invariance issues, another set of studies tested the measurement invariance of a scale (Marshall & Enzmann, 2012a; Ren, Zhao, He, Marshall, Zhang, & Zhao, 2015). This dissertation suggests that cross-national research should test measurement invariance across different countries before conducting any additional analysis.

Thus, the purpose of this dissertation is to address both theoretical and methodological challenges of cross-national criminology research. To achieve this goal, I draw from three existing contemporary criminological theories in the manner suggested by Karstedt for creating a testable theory of crime for cross-national research (Karstedt, 2001). Using the three existing theoretical frameworks of self-control theory, social bonding theory, and routine activities theory, the generalizability of this integrated theoretical framework is tested across different countries using central theoretical concepts of Institutional Anomie Theory. In addition, I conduct multiple-group confirmatory factor analyses in order to test the cross-cultural comparability of measurement (Farrall et al., 1999; Farrall, 2004). Ultimately, this study will answer the following questions; 1) is an integrated theoretical framework combining social bonding, self-control, and routine activities theory with Institutional Anomie Theory a useful way to further our understanding of youth crime in a cross-national context? In addition, 2) Does
measurement invariance testing increase the validity of the result of cross – national research?

**Organization of the current Dissertation**

In the next chapter, I discuss the comparative method in the social sciences, the benefits and challenges of the comparative method, and previous researchers’ endeavor to respond to the methodological challenges of the comparative method. Then the definition of measurement invariance, procedures for testing measurement invariance, and evaluation of measurement invariance testing follows. Finally, it outlines issues related to measurement invariance testing in criminology. Then in chapter 3, I present the theoretical framework for the dissertation drawing from self – control theory, social bonding theory, routine activities theory, and institutional anomie theory. After I discuss the methodology used to accomplish the goals of the dissertation in chapter 4, I present the results from measurement invariance testing and binomial regression analyses in chapter 5. Finally, the discussion and conclusion are presented in chapter 6.
CHAPTER II
COMPARATIVE RESEARCH

Introduction

This chapter is comprised of three sections. The first provides the broader context of comparative research by providing its definition, goal, and benefits. The second part explores more closely some theoretical and methodological challenges of the comparative method. From a theoretical perspective, there is a need to develop and test crime theory that is applicable across different national and cultural settings. From a methodological perspective, there is a need to properly establish measurement invariance that is a prerequisite for valid cross-national comparisons. Finally, in the third part, I suggest how this dissertation attempts to contribute to the methodological and theoretical challenges of cross-national criminological research.

Comparative Research: definition, goal and benefits

Comparative research is also referred to as cross-national or cross-cultural research. Much of the earlier writings on comparative research draw from the field of cultural anthropology. Thus, a discussion of comparative research needs to start with a brief exploration of the concept of ‘culture’. There are many different understandings and definitions of culture. I adopt House and his colleagues’ (2004) definition; “a set of parameters of collectives that differentiate the collectives from each other in meaningful ways”. According to House and colleagues, culture is variously formed by shared processes, shared ways of thinking, feeling, and reacting, shared meanings of identities, shared
socially constructed environments, and commonly experienced events including the history, language, and religion of their members (House et al., 2004: 15, 57). Based on the definition above, culture can differentiate one group from another based on a certain set of values, belief, behaviors, and attitudes, which are shared, interpreted, and transmitted over time within a collective, and that makes the collective unique and distinguishes that collective from other collectives (Bik, 2010). Comparative research focuses on national cultures, in other words, particularly, on cross–national cultural differences. The strong forces that shape a national culture include ecological forces, history, language, wars, and religions; and these factors in turn, influence the development of national values, beliefs, norms, and behavioral patterns (Leung et al., 2002). These dominant forces are reflected in each country’s culture, which is intertwined with many social phenomena within that country. This is the core reason why comparative research in the field of criminology is necessary; cross–national cultural differences have their impact in the specific context of an individual’s criminal behavior. Culture is too important to ignore. The importance of culture is further addressed in Chapter 4.

Cross–national, cross–cultural, and comparative research seeks to compare a wide range of individuals’ opinions, attitudes, values, and abilities across different cultural groups (Kankaras & Moors, 2012). Cross–national research has been conducted in a number of different disciplines, including economics, anthropology, psychology, sociology, social psychology, political science, marketing, management, public administration, and criminology and criminal justice (Sekaran, 1983). More recently, interest in comparative research as grown because of the increasing availability of large, global surveys and
datasets. Interest in comparative research has been stimulated by a variety of situational factors (van de Vijver et al., 1998). Recent economic, social, political, and technological developments have reduced the importance of established national boundaries. In essence, globalization has transformed many local issues into global ones. One prominent example has been European integration—the continent’s integration and removal of internal national boundaries has enabled researchers to conduct large international surveys and has increased interest in cross–national comparative research.

The term ‘comparative research’ stands for "social scientific analyses involving observations in more than one social system, or in the same social system at more than one point in time" (Warwick & Osherson, 1973). The use of systemic comparison across societies for generalizing about human behavior can be traced all the way back to Herodotus (B.C. 495) (Warwick & Osherson, 1973). The history of comparative methods in the social sciences can be found in detail in many books and articles (Vallier et al., 1971; Warwick & Osherson, 1973; Sjoberg, 1955). Classic works of scholarship employing the comparative method include those by Alexis de Tocqueville, Marx, Weber, Durkheim, and others in the fields of sociology, anthropology, psychology, economics, and political science. During the Cold War, comparative research flourished as government support and funding

---

1 Prominent examples are the European Social Survey (ESS), International Social Survey Program (ISSP), European Values Study (EVS), World Values Survey (WVS), General Social Surveys (GSS), The European Election Studies (EES), European Crime and Safety Survey (EUICS), and International Crime Victimization Survey (ICVS). In addition, with the help of international agencies like Eurostat, International Labor Organization (ILO), International Monetary Fund (IMF), Organization for Economic Co-operation and Development (OECD), UNECSO, United Nations (UN), International Criminal Police Organization (INTERPOL), World Health Organization (WHO), and World Bank, researchers can easily access international surveys and data.
for foreign intelligence and area studies programs surged (Warwick & Osherson, 1973). In comparative or cross-national research, one or more units in two or more societies, cultures or countries are compared using the same concepts and phenomena or systematically analyzed, with the purpose of explaining of explanation and generalization.

Comparison is the process of discovering similarities and differences among phenomena (Warwick & Osherson, 1973). Making comparisons is inherent to the field of sociology, given that sociologists choose to observe selected social phenomena and relate them to other phenomena. Generally, no single social phenomenon can be understood in isolation, thus sociologists engage in the process of comparative work by drawing from sociological theory (Øyen, 1990). Because understanding normal human behavior cannot be accomplished without acknowledging deviations from the norm, finding similarities and differences in the process of comparison is necessary for sociologists (Øyen, 1990). The goal of comparative research in social science is to search for similarities and differences within social phenomena, by making comparison on the object of study within different contexts. Thus, comparative research compares countries with respect to the same concepts, with the intention of making generalization or in order to gain a better understanding of the social phenomena under study (Hantrais & Mangen, 1996).

Several important benefits of examining social phenomena based on comparative research method should be discussed. The biggest justification of comparative research is to establish the generalizability of theories and results. According to Marshall and Marshall (1983), the comparative method has two distinctive goals: 1) testing the universality of a proposition (theory testing) and 2) determining the specifications of a proposition (theory
All theory aims to generalize relationships among variables. The comparative method is one of the best ways to determine the generalizability of findings because it enables theory testing to take place across all relevant cultural settings (Warwick & Osherson, 1973). For instance, in order to test the generalizability of theory, we need to check whether or not cultural, personality, and societal characteristics produce systematic varieties. A good theory tries to explain phenomena with the least number of concepts and propositions (Warwick & Osherson, 1973). Even if a certain social science theory does not provide any causal mechanism, concepts such as culture, nation, society, and political system can be incorporated into a general theory, using the comparative method. Comparative research contributes to specification of theories by suggesting more concise explanations than previously existed (Warwick & Osherson, 1973).

Through comparative research, researchers can produce a deeper understanding of the most critical issues that are of central concern in different countries, open new directions and useful avenues for future research, help to sharpen the focus of analysis of the subject under study by suggesting new perspective, and lead to the identification of gaps in knowledge (Hantrais & Mangen, 1996).

Overall, the comparative method provides researchers with an opportunity to assess the power of a theory by determining its scope and generalizability as well as by presenting comparison among different groups on the social system level, which is not possible by studying only one culture or country. However, several comparative scholars have recognized the risk of relativism when we are conducting comparative research (Nelken, 2009; Cain, 2000; Fraser, 2013). The concept of Ethnocentrism, Occidentalism, and
universality provides the justification that what we do is universally shared or it would be right for everyone else for comparative researchers to compare among different groups (Nelken, 2009). By taking examples of the cultural meanings of punitiveness and tolerance between Italy and Netherlands, comparison can be a problem not only when we think our practices are the best, but also when we want to compare others on the basis of what we think would be the best practices (Cain, 2000).

**Comparative Research: theoretical and methodological challenges**

Although comparative research has advanced our understanding of national cultural aspects of social phenomena, it has both challenges theoretically and methodologically. This part discusses some of these challenges.

Comparative research typically attempts to explain social phenomena using theories developed within one country (Farrington, 2000). Given that most theories were originally developed for use in one particular culture, researchers can not readily draw from universal or broad existing theories to export ideas developed in one cultural setting to another settings (Karstedt, 2001). Theories developed within single cultural settings may be too simplistic or idiosyncratic to explain social phenomena in a variety of different settings. The main benefit of comparative research is that it allows for the assessment of the generalizability of certain theoretical frameworks. Thus, one challenge is to identify a theoretical framework which has the potential to be generalizable across different countries. In the current dissertation, we propose that the integrated social bonding, self-control and routine activity theory framework has enough conceptual power to allow generalizability across a large number of countries. [And we will argue in addition that
Institutional Anomie Theory has the potential to provide the needed contextual specification across these countries.

The primary methodological challenge for the comparative method is translating a concept from one cultural context into another one. Øyen (1990), a social anthropologist, discussed the methodological challenges related to observations drawn from within Western culture and applying them to other cultures. Specifically, distortion of the content and meaning of the concepts must not be permitted, and valuable information must not be lost through translation (Øyen, 1990). Thus, scholars in social sciences have mainly focused on conceptual equivalence, equivalence of measurement, and sampling (Warwick & Osherson, 1973).

Conceptual equivalence is the basic theoretical question of whether concepts under study have equivalent meanings across the social units under studied (Warwick & Osherson, 1973). For conceptual equivalence, three main criteria have to be established. The first one is the dimension of universality. Warwick and Osherson (1973) identified general notions in Western cultures (e.g. mother, incest, socialization, illness, deferral bureaucracy, and arctic hysteria) and claimed that these concepts are unlikely to be universally understood in all cultures. Definitional comparability is the second aspect of conceptual equivalence. It holds that concepts do not have to be necessarily identical in meaning, but conceptual equivalents have to exist. Smelser (1976), a comparative researcher, highlighted the difficulties of defining economic concepts in particular. In addition, Alexander Leighton and colleagues (1963) pointed out the importance of comparable definitions of mental disorders in cross-cultural studies. They found many
psychiatric definitions derived from Western cultures (e.g. mental deficiency, psychologically expressed disorders, and psychologically derived disorders) are not necessarily applicable to other societies. The final aspect of conceptual equivalence is the identifiability of concepts. This is the assumption of whether or not any concept can be applicable into any given cultural settings. For instance, while the concept of a “mother” is readily identified observationally in almost every culture, there is no analogous term for “mental deficiency” across cultures. Warwick and Osherson (1973) emphasized that wide variation in the identifiability of a central concept results in methodological challenges for comparative research, including formidable problems of measurement. Even if comparable conceptual definitions in the societies under study exist, comparative researchers further face the challenge of developing equivalent indicators (Warwick & Osherson, 1973). Ultimately, these issues suggest the overall difficulties of transitioning from theoretically meaningful concepts to empirically observable manifestations.

Comparative researchers have identified five overlapping problems related to equivalence of measurement: differential researchability, comparability of stimuli, context, response, and reliability-validity (Warwick & Osherson, 1973). The first aspect of equivalence of measurement, researchability, needs to be considered because theoretically applicable concepts may differ in different cultures under study. For instance, the notion of “looking for work” (a key element in studies of unemployment in the developed world) is irrelevant to tribesmen and peasants in many parts of the Third World (Warwick & Osherson, 1973). In addition, the unwillingness of respondents to answer questions on sensitive topics is a barrier to researchability. Respondents may feel uncomfortable participating in the comparative research because of the perceived harm it could do to
their community and society. Another example of researchability is when respondents are unable or unaccustomed to discussing the certain topic. As an example, in the study of the socialization of adolescents, Danish teachers claimed that they were unaccustomed to analyzing matters of adolescents’ interactions and could express no judgment or opinions on the subject (Stodolsky & Lesser, 1973).

When conducting comparative research, different indicators are often needed to capture the same concept in different cultures. Intelligence can be defined as the ability to adapt effectively to the society in which one lives (Warwick & Osherson, 1973). However, the appropriate indices of adaptation will be different in rural Asia as it is in the urban United States. Thus, for comparability, all items must be culture-specific. There are several ways to approach the question of equivalence in stimuli. Before comparative research is conducted, collaboration between knowledgeable members of all the participating societies must be consulted. If collaboration is not possible, some type of preliminary exploration has to be investigated through ethnographic reports, travelers’ accounts, and the like (Warwick & Osherson, 1973).

According to Warwick and Osherson (1973), social scientists can never guarantee that a set of questions developed in one society can be translated and exported for use in another cultural setting. If social scientists from different countries in a certain comparative study are not involved in choosing the concepts and developing the questions, they cannot be sure the items in the study are formally identical and functionally equivalent in meaning from society to society. At the very end of the study, it is often difficult to determine whether different findings reported in the study stem from variations
in national cultures, from different meanings attached to the questions in the countries, or from other irrelevant factors in the study.

Based on the methodological challenges mentioned above, when using comparative research methods empirically, researchers encounters three related methodological problems, all of which can be categorized under the problem of comparability. The first problem is whether the dependent variables, such as the events and situations the researcher wish to explain, are comparable from one sociocultural context to another (Warwick & Osherson, 1973). For instance, one could ask how we can compare crime rates among different countries using data collected centuries ago. The second problem is related to the general dimensions used to compare societies, whether the dimensions distort events and situations cross-culturally. If the political, economic, social, or cultural aspects of two societies are compared, we are not sure whether these dimensions are comparable in both societies. The third problem is when different social units are used for comparison. It is not appropriate to compare societies that have very different social systems, such as between a highly complex nation-state (the United States) and small tribe in an Asian country.

**Theoretical integration as a way to overcome cross-national theoretical challenges**

As already alluded to briefly in the previous section, theoretical integration has been suggested as a way to overcome the challenges related to theory development and-testing within a cross-national context. Some researchers have suggested that integrating existing theories into a comprehensive framework may be one potential solution for the theoretical poverty of comparative research (Pratt & Godsey, 2002). In addition, more recently,
researchers emphasize the need to include macro-level social change in their explanatory frameworks, as well as suggesting micro-macro level integration as a new avenue of theoretical development. Such developments would account for diversity in national contexts as well as historical change (Messner, 2011).

Theoretical integration is, generally, defined as “the act of combining two or more sets of logically interrelated propositions into one larger set of interrelated propositions, in order to provide a more comprehensive explanation of a particular phenomenon” (Klein, 1989, p. 75). According to Muftic (2009), there are generally three goals of theoretical integration; theory reduction, increasing explained variance, and theory development through the clarification and expansion of existing propositions and theoretical concepts. Although opponents of theoretical integration argue that integration is not possible because of differences in underlying philosophical assumptions and the complexity of integrated theoretical models (Hirschi, 1979, 1989), proponents, however, argue that theory competition can inhibit theoretical development (Bernard & Snipes, 1996). By integrating existing theories, researchers explain a greater portion of the variance that remains unexplained by separate theories (Messner et al., 1989).

Especially, the micro-to-macro linkage is one of the most promising areas of future research for the solutions of theoretical challenges of comparative research. By integrating micro- and macro-level variables, comparative researchers can recognize the possible role of different levels of determinants, such as social structure, on an individual's behavior (Messner, 2011).
Macro-level theories “link social structure characteristics to variations in the rates and distributions of crime” (Bernard, Snipes, & Gerould, 2016). On the other hand, micro-level theories “link individual characteristics to the probability that an individual will engage in criminal behavior” (Bernard, Snipes, & Gerould, 2016). Macro–micro theoretical integration combines macro- and micro-level theoretical explanations. The principal weakness of macro-level theories is their inattention to “personal motivation or the agency of the individual offender (Barak, 1998, p. 197). On the other hand, the primary weakness of micro-level theories is their inattention to “the context within which individuals are embedded and, more specifically, the vulnerability of micro-level processes to local economic and social conditions” (Bellair, Roscigno, & McNulty, 2003, p. 25). Thus, integrated macro-micro theories examine the effect social structure has on individual characteristics and subsequent individual action (Paternoster & Bachman, 2001).

Identifying mediating and moderating linkages between macro- and micro-level variables, macro-micro theoretical integration differentiates the causal properties of structural and individual factors.

A fundamental assumption underlying the micro–to–macro linkage is that individuals’ social behaviors are determined to some extent by social forces in their wider environment. The importance of linking both theoretical frameworks examining both the macro and micro levels into comparative research can be justified in several ways. Most sociological theories assume that social structural conditions have a direct impact on an individuals’ behavior independent of their personal characteristics. Thus, if comparative studies exclude this wider context, they would suffer from serious problems with model specification. Second, many individual–level effects are actually reflective of
neighborhood, community, and country-level dynamics. For example, the strong impact of the financial situation of a certain country on individual’s economic behaviors is commonly attributed to the life-style of such persons. Under this condition, if we exclude the contextual factor, this would not specify the true relationship between individual’s characteristics and economic behavior. Thus, macro measures are important in comparative research, because they may directly influence human behavior and explain the effects of individual-level variables.

**Measurement Invariance Testing as a way to overcome cross-national methodological challenges**

In comparative research, the same instruments are generally used for all involved groups of interests. Researchers who conducted this kind of comparative research frequently assume that obtained results are comparable for valid comparison across the groups. However, this assumption of results’ comparability is untested and focuses only on the difference in average scores of the two or more cultural groups. Therefore, when testing for cross-cultural differences in any comparative research, a fundamental concern of ensuring invariance arises (Hui & Triandis, 1985). Therefore, without strong evidence of invariance, comparisons of the survey scores across different countries may be potentially erroneous or misleading.

As claimed by comparative scholars, the lack of evidence for measurement invariance raises concerns about whether the survey items capture the same theoretical construct in another countries or cultural settings (Vandenberg & Lance, 2000). In the end, this concern may raise suspicion that the results of cross-national comparisons might not be meaningful or valid. Evidence of measurement invariance is one of the most important
methodological challenges of comparative research. Specifically, differences in observations across different countries might be due to true differences between countries or they may be due to systemic biases related to the different ways of responding to certain items between different countries. Thus, cross-national differences of scale scores might reflect real differences of constructs across countries and differences in scale reliability rather than reflect non-invariance of the constructs measured from all involved countries (Steenkamp & Baumgartner, 1998). Accordingly, researchers should ask: do the survey items offer a cross-nationally valid measurement across different countries? Cross-national researchers have to test and establish measurement invariance in order to determine whether measurements capture the same underlying constructs in each participating country under study.

Measurement invariance refers to an instrument’s ability to measure the same construct in the same way across different groups (Millsap & Kwok, 2004). Measurement invariance has been tested by comparing means and variances across different groups. However, comparing means and variances is not the same as comparing the underlying measurement structure across sub-groups (Vandenberg & Lance, 2000). A central premise of measurement invariance is that the scores across groups are on the same scale. In addition, the relationship between test items and theoretical constructs of interest must remain stable across groups (Reise, Widaman, & Pugh, 1993). That is, the measurement relates to the theoretical construct of interest (e.g. attachment, risky routine activities, and self-control) in the same way across different groups. Therefore, researchers should compare whether the number of factors and the items that make up a factor are similar across different groups. Comparing differences in means is required to determine if there is
an equivalent underlying model. Thus, it is essential to investigate the means and measurement structure for valid comparison across different groups (Gregorich, 2006).

When a measurement produces the same observed scores for individuals who have identical attributes being measured, measurement invariance is established (Meade & Bauer, 2007; Schmitt & Kuljanin, 2008). Measurement invariance testing has generally employed several measurement conditions (Meade & Bauer, 2007; Vandenberg & Lance, 2000). The generalizability of scale or measurement across subgroups of a population is the first type. Sometimes, it may be required to generalize among subgroups which are located in a single culture or diverse cultures. For instance, when research is conducted among different gender, age, race, ethnicity, area, country, and subcultural groups, it is required to establish invariance testing to see whether a scale or measurement developed in one culture works in other ones as well (Byrne et al., 1989; Rensvold & Cheung, 1998). Whether a test or measurement developed in a certain country may be translated and utilized in a different country is an important methodological question for cross–national research method (Cheng & Rensvold, 2000). Thus, measurement invariance testing is of great concern for cross–cultural researchers.

According to Yoon and Millsap (2008), measurement invariance is a broad term encompassing both linear and nonlinear relationships between observed variables and latent factors with special attention to the whole score distribution. In a factor model, measurement invariance is called factorial invariance (Meredith, 1993; Yoon & Millsap, 2008), which is expressed within a linear factor model with mean and covariance. Measurement invariance testing is generally conducted with linear confirmatory factor
analysis (CFA), which is defined as the equivalence of parameters specified in the model across groups. Thus, there are different levels of factorial invariance, which can be determined depending on the parameters in testing of invariance. For comparative research methods, the general structural equation models can be expanded to multiple group confirmatory factor analysis by applying a group indicator into CFA.

In the multi-group confirmatory factor analyses model, factorial invariance testing covers the first four null hypotheses which test the invariance of variance covariance matrices of observed variables, factor loadings, intercepts, and unique variance of observed variables, sequentially. Then the last two null hypotheses are for the equalities of factor variance covariance and factor means over groups, respectively. This order is the step to test multi-group confirmatory factor analysis. More details follow in the next section regarding procedures for testing measurement invariance. As indicated in the prior section, different levels of factorial invariance are tested, depending on the certain set of parameters which are tested for group equality. Researchers must keep in mind two suggestions about the sequence of measurement invariance testing. It is not necessary or easy to attain in reality the full invariance of all levels. In addition, the sequence of different levels of invariance testing is largely determined by research questions and interest of the study (Vandenberg & Lance, 2000).

Configural invariance Researchers are interested in the configuration of a model across different groups. As the most basic level of measurement invariance, the configural invariance testing gauges whether similar factors are measured across the groups (Widaman & Reise, 1997). It tests whether or not participants from different groups
conceptualize the construct in the same way. Thus, at this level of invariance, it is not necessary that the set of observed indicators and the construct have exactly the same strength but that the same set of item must be associated with the same latent factor in each group. The configural invariance testing model works as a baseline model for other types of invariance tests. Comparing each model to the baseline model, researchers determine whether group invariance can be established or not. Researchers have used the configural invariance as “same simple structure” (Meredith, 1993), “weak factorial invariance” (Horn & McArdle, 1992), “baseline model” (Bagozzi & Edwards, 1998), “equality of factor structure” (Cole & Maxwell, 1985), “conceptual equivalence of measures” (Vandenberg & Lance, 2000), “conceptual equivalence” (Hui & Friandis, 1985), and “construct equivalence” (van de Vijver & Leung, 1998).

**Metric invariance**  The configural invariance testing does not enable a straightforward comparison of results, because it does not indicate whether respondents from different groups assign the same meaning to items. On the other hand, *metric invariance* is a more stringent form of invariance given that it assumes that the relationship between observed indicators and the concept of latent factor is equal across groups (Cheung & Rensvold, 2000). In other words, metric invariance implies the equality of the measurement unit or intervals of scale on the latent concept is measured across different groups (Steenkamp & Baumgartner, 1998; can de Vijver & Leung, 1998). Focusing on inter-group equality of slope parameter, researchers can test whether the factor loadings of each item are equal across different groups. If so, the researcher can be confident that items and questions in survey are understood in a similar way in different groups. Thus, this invariance test enables the testing of instrument measures of the same latent construct in all of groups in
According to van de Vijver and Leung (1998), meaningful comparisons of regression coefficients and covariances are possible, when partial metric invariance for all groups in the study is obtained.

**Scalar invariance**  For establishing measurement invariance and full comparison of groups' scores, it is necessary that the scales of the latent construct have the same origin (Meredith, 1993). The scalar invariance refers to the invariance of intercepts across groups. The establishment of both the metric and scalar invariance is useful when the main research question of group comparison research including cross-national research needs the comparison of mean scores across groups. Metric and scalar invariance are necessary for latent mean comparison across groups. For instance, individuals who have the same score on the latent construct would obtain the same score on the observed variable regardless of their group membership. By constraining the intercepts of items to be the same across groups, the scalar invariance is tested. To compare scores across different groups, this model is the last necessary model to test. All additional tests are optional and meaningful in specific research purposes.

This study seeks to make a contribution to an understanding of partial invariance. Methodologists have noted that invariance of the parameters for all items is not necessary for meaningful comparison (Steenkamp & Baumgartner, 1998). In reality, metric and scalar invariance are unlikely in many situations. Thus, researchers can compromise between full measurement invariance and lack of measurement invariance (Kankaras & Moors, 2010). Comparison across different groups can be made in a valid way if at least two items within one construct are invariant (Kankaras & Moors, 2010). One items within a scale needs to be
work as a “marker” item to define the scale of each latent construct. Also, to test the invariance of the marker item, one more item needs to be invariant.

Confirmatory factor analysis is a model testing technique in which a theoretical model is compared with the observed structure in a sample (Milfont, Fischer, & Ronald, 2010). To determine the degree to which the theoretical model is consistent with the empirical data, researchers use goodness-of-fit indices after each level of invariance testing is performed. These indices indicate how well the empirical data fit the proposed theoretical model. Statistical tools, such as LISREL, Amos, EQS, and Stata provide several indices to assess how well a hypothesized model fits the sample data. The likelihood ratio test (referred to as the chi-square or $X^2$ test) between a baseline model and sequentially constrained models is an objective model fit index, which has been traditionally used as a goodness-of-fit statistic in structural equation modeling. However, the literature of measurement invariance has reported that chi-square test is too sensitive to the size of a sample (Bentler & Bonett, 1980). Thus, it has been recommended to use the likelihood ratio test as a measure of fit instead of a test statistic (Bollen, 1998).

To overcome limitations of the likelihood ratio test, several fit indices have been developed (Hu & Bentler, 1999; Kaplan, 2000; Mulaik et al., 1989). Referred to as absolute fit indices, these fit indices assess improvement in fit by comparing a target model with a more constrained nested model (Hu & Bentler, 1999). Given that diverse fit indices deal with different aspects of fit, researchers should report multiple fit indices in structural equation modeling studies (Thompson, 2000). The absolute fit indices used to evaluate overall model fit are as follows: the likelihood ratio test, the chi-square to degrees of freedom ratio ($X^2/df$) (Wheaton, Muthen, Alwin, & Summers, 1977), the root mean
square error of approximation (RMSEA) (Steiger & Lind, 1980), and a standardized version of Jöreskog and Sörbom’s (1981) root mean square residual (SRMR).

According to methodologists, a $X^2/df$ ratio of 5:1 or less indicates a good fit (Carmines & McIver, 1981); RMSEA and SRMR values close to .06 and .08 respectively indicate acceptable fit (Hu & Bentler, 1999); and RMSEA values in the range of .08 and .10 indicate medium fit and above .10 indicate poor fit (Browne & Cudeck, 1989). In addition, to test the improvements over competing models, several indices should also be considered, such as, the difference in chi-square between two nested models ($X^2$ difference test), the comparative fit index (CFI) (Bentler, 1990), the expected cross-validation index (ECVI) (Browne & Cudeck, 1989), and a consistent version of Akaike’s (1987) information criterion (CAIC) (Bozdogan, 1987). Results from the $X^2$ difference test indicate that the model with smaller $X^2$ has a statistically better fit. However, this difference can be influenced by the large samples. Thus, the $X^2$ difference test has been used for significant improvements of models. Alternatively, CFI values close to .95 indicate acceptable fit (Hu & Bentler, 1999). Lower ECVI and CAIC values reflect the model with the better fit (Garson, 2008). And MacCallum et al. (1996) suggested that 90% confidence intervals (90% CI) were also reported for both RMSEA and ECVI.

Although several techniques have been developed to test measurement invariance (Hui & Triandis, 1985), the multi-group confirmatory factor analysis model has been accepted as the most powerful tool for testing cross–national measurement invariance (Steenkamp & Baumgartner, 1998). Assessing the cross–national comparability of the measurement of criminal behavior and individuals’ psychometric measures is rarely done for a number of reasons: the lack of measurement invariance testing literature, the lack of
widely unified terminology of measurement invariance testing, criminologists’ uncertainty regarding measurement invariance testing for cross-national comparison, and the absence of clear guidelines to test measurement invariance. In the current dissertation, one of the objectives is to contribute to our understanding of cross-national measurement invariance.

In 2015, Ling Ren and her colleagues (2015) tested measurement invariance of attachment across Chinese and American adolescents. They compared the concept of attachment by taking two different countries with very different cultural foundations (e.g., between Chinese and American adolescents). They focused on the concept of an adolescent’s attachment to conventional institutions – attachment to parents, attachment to school, and attachment to neighborhood. Prior literature indicated that the concept of social attachment has been studied thoroughly in both counties. In particular, the three basic types of attachment—attachment to parents, school, and neighborhood—have been empirically tested extensively in both countries. However, given that the cultural context is much different between the two countries, China and the United States, the authors needed to test the measurement equivalence of the three-factor model of attachment among adolescents living in both countries. Thus, the authors tested whether a three-factor model equivalently measures the theoretical construct of attachment in both countries. After the non-equivalent items of attachment were found, the authors investigated which items were significantly nonequivalent between the two countries in order to obtain partial equivalence between them.

Then, the authors conducted testing for invariance of the three-factor measurement model of attachment across both countries. When they tested multi-group confirmatory
factor analysis models using the combined data, the results from chi-square difference test between models indicated there was non-invariance across countries. So, in order to reach the partial invariance of measurement, the authors repeated four additional models removing four items step by step (Ling Ren et al. 2015). After dropping two variables for school attachment and three variables for neighborhood variables, the authors found equivalent factor loadings and covariance between the Chinese and American adolescents. As the last step of analysis, OLS regression analyses were conducted in order to assess the predictability of three-factor attachment model on delinquency, low self-control, and pro-violence attitude. Among Chinese adolescents, all three types of attachment were inversely associated with delinquency. In addition, male adolescents committed more delinquent acts than females, have lower level of self-control, and have more pro-violence attitudes. On the other hand, among American adolescents, while family attachment and school attachment were both significant predictors of delinquency, neighborhood attachment was not.

The study discussed in the paragraphs above provides evidence for the necessity of measurement invariance testing in the field of criminology. First, its findings indicated that measurements presenting theoretical constructs differed between different countries, and cultural settings. The findings of measurement invariance are not consistent between different cultural settings; attachment to parent, school, and neighborhoods were partially invariant. Thus, more studies are required with a larger number of countries in order to establish the generalizability of theoretical ideas drawn from social bonding, self-control, and routine activity theory, using the measures that were used by Ling and her colleagues.
Conclusion

The current chapter on the comparative research method suggests ways to deal with current theoretical and methodological challenges of comparative research. First of all, we noted that given that most of criminology theoretical frameworks have been developed in American and western cultural settings, comparative criminologists need to test whether it is reasonable to export ideas developed in the United States to other countries. We also want to take into consideration that individual social behaviors are determined by social structural factors in their wider environment. There is a need to integrate macro- and micro-level variables in order to investigate how social structural conditions may have an impact on individuals’ behavior and attitudes. In addition, comparability of instruments has to be tested to make sure that the theoretical concepts under study have equivalent or same meaning across different countries. This may be done by measurement invariance testing, using multiple group confirmatory factor analysis. By testing measurement invariance, configural invariance, metric invariance, and scalar invariance, researchers can evaluate whether similar item factors, the relationship between observed indicators and the concept of latent factor, and the scale of the latent construct are equal across different groups (Cheung & Rensvold, 2000). In this chapter we have laid the groundwork for the two main objectives of this dissertation. First, we want to test the measurement invariability of the major theoretical concepts drawn from social bonding, self-control and routine activity theory among a sample of 12-16 year olds in 25 countries. Second, building on the results of our measurement invariability analysis, we test the generalizability of six hypotheses drawn from our integrated theoretical framework across 25 countries.
CHAPTER III
THEORETICAL FRAMEWORK & LITERATURE REVIEW

This dissertation tests propositions derived from social bonding theory, lifestyle/routine activities theory, and self-control theory across countries grouped by level of institutional anomie. To provide the context for the conceptual framework of the dissertation, the chapter starts with the theoretical background of the dissertation, the related empirical research on the central theoretical propositions of this study, and the cross-national applicability of the theories. The second section of the chapter provides a brief discussion of the integration of the theoretical perspectives and the importance of culture in cross-national criminology. Finally, hypotheses based on the theoretical review and supporting empirical research are presented.

Social Bonding Theory

In his book *Causes of Delinquency*, Hirschi (1969) developed social bonding theory to explain how delinquency occurs (Einstatder & Henry, 2006; Lilly, Cullen, & Ball, 1989). Hirschi’s theoretical concept is derived from classical criminology, based on the assumption that all individuals in societies are rational decision-makers. According to classical criminologists, human nature is hedonistic; thus, all individuals commit crime and engage in delinquent behavior to maximize their pleasure. While other criminological theories attempt to explain why individuals commit crime, Hirschi and other control theorists seek to answer why individuals do not commit crime (Akers & Sellers, 2009). Specifically, given that Hirschi (1969) holds the perspective that an individual’s conformity
to society is not an inherited internal characteristic, he explores why and how individuals come to conform to the rules of society. Hirschi argues that individuals are born badly with a natural and inherent propensity toward crime. Thus, criminal disposition exists already in them and bonding to others constrains their disposition to commit crime. Consequently, according to social bonding theory, an individual’s bonding to society prevents them from engaging in crime and delinquent behavior (Akers, 2000).

The central theoretical premise of Hirschi’s theory is that an individual’s conformity will be formed when he or she develops bonds with conventional society. Thus, crime and delinquent behavior are the result of an individual’s weak or broken bonds to society. In the beginning, Hirschi (1969) contended that the individual’s development of social bonding is a process to internalize prosocial values and learning to access legitimate social roles. This process begins in childhood. According to Hirschi, the strength of the individual’s social bonding to society varies depending on each individual. It is because the individual gains the process for internalizing prosocial values and access to legitimate social roles differently at different stages of life. So, rather than focusing on the influence of an individual’s risk factors on crime, Hirschi emphasizes only the presence, absence, and strength of the individual’s bonding to society to understand his or her delinquent behavior.

According to Hirschi (1969), individual’s bonding to society is composed of four components: (1) attachment to significant others, (2) commitment to conventional behavior, (3) involvement in conventional activities, and (4) belief in the society’s normative system. The four elements operate independently, but at the same time, a
change in one may cause a change in another. In addition, each component of the social bond works as a constraint against engaging in criminal and delinquent behavior.

According to Hirschi (1969), attachment, the first element of social bonding theory, refers to the relationship with significant others, which is important for formulating an individual’s closeness to societal rules and standards. Hirschi contends that one’s attachment to significant others, including parents, conforming peers, and teachers, functions to prevent him or her from engaging in delinquent acts, because the more one respects or admires one’s friends, parents, or teachers, the less likely he or she is to commit delinquent acts. He wrote “We honor those we admire not by imitation, but by adherence to conventional standards” (p. 152). This is because individuals care about and are sensitive to significant other’s opinions and expectations (Hirschi, 1969; Le Blanc & Caplan, 1993).

Hirschi (1969) argues that three dimensions affect attachment to parents: (1) the psychological hold that parents have on youth, (2) the intimacy of communication between parents and child, and (3) the youths’ affectional identification with their parents. Hirschi explains that parents’ psychological presence prevents their children from engaging in delinquent acts because kids are concerned about their parents’ negative reaction to their behavior.

Attachment to peers is another key element of attachment to significant others. Hirschi (1969) examined the effects of attachment to delinquent peers and prosocial peers. He suggests that the number of delinquent friends and frequency and quality of contacts with them increase a youth’s potential exposure to delinquent acts. Another important dimension of attachment to peers is the youth’s affectional identification with friends.
Hirschi hypothesizes that the more youths receive respect and value from their friends, the less likely they will behave in ways that damage their friendship.

School is the third important element of an attachment to significant others. Attachment to school is significant because it develops youths’ bonds with prosocial and conventional institutions. Such attachment can be measured by youths’ attitudes toward educational institutions, academic ability and performance, self-perceived academic competence, concern and regard for their teachers’ opinions, and acceptance of the school’s authority (Hirschi, 1969; Le Blanc & Caplan, 1993). Hirschi hypothesized that youths who have a positive attitude about their capability to succeed in school are less likely to engage in delinquent acts. In addition, he argues that the less youths care about their teachers’ opinion about them, the more likely they will engage in delinquent acts. Hirschi also hypothesized that youths who have negative feelings toward school authority are more likely to deny the legitimacy of school authority.

Commitment, the second main component of the social bonding theory, refers to an individual’s investment of time and energy in prosocial activities, including attempting to achieve good grades, spending more time on homework, and pursuing future and educational activities (Hirschi, 1969; Sigfusdottir, Thorlindsson, & Bjarnason, 2007). According to Hirschi, there are three key elements in commitment: individual achievement orientation, educational and occupational expectations, and an individual’s passage into adult status. Achievement orientation refers to the youths’ desire to do well in school-related activities. Hirschi hypothesizes that the youth do not want to put their academic investments at risk by engaging in delinquent acts. Educational and employment expectations refer to youths’ desire to achieve middle-class status. Hirschi defines the
passage into adult status as the state of the negative dimension of commitment. Specifically, the more a youth is committed to “adult status,” the weaker his or her commitment to conventional acts. And he hypothesizes that youths who engage in adult activities are more likely to be involved in delinquent behavior, given that they enjoy the “privileges of adulthood without being burdened” by adult responsibilities (p. 163). To measure the passage into adult status, Hirschi asks questions such as “Do you drive a car you don’t own?” (p. 163).

Involvement in conventional activities, which refers to the choice of individuals to be involved in socially acceptable or conventional behaviors, is the third element of social bonding. Activities such as doing homework are an example of this aspect of social bonding (Hirschi, 1969). Hirschi hypothesizes that the more a youth is engaging in conventional prosocial activities, the less time he or she engages in delinquent acts. The final element of Hirschi’s social bonding theory is belief in a society’s normative system, which refers to an individual’s acceptance of a general value system within a society. He contends that delinquent youths feel that there are no moral obstacles.

A large body of empirical studies testing Hirschi’s (1969) social bonding theory supports it as a significant explanation for delinquency, violent crime, and property crime. According to Hirschi, one would expect to find that people attached to parents, peers, and schools are less likely to engage in crime and delinquent behaviors. Among these attachments, parental attachment has been found as a particularly important factor in delinquency (Bowlby, 1969; Hirschi, 1969; Hoeve et al., 2009; Hoeve et al., 2012). For example, Fagan, Van Horn, Hawkins, and Arthur (2007) assessed social bonding variables using self-reported data from 7,349 tenth-grade students regarding adolescent substance
use. They found that all parental controls were significantly related to adolescent drug use, suggesting that parents’ higher level of control is associated with less drug use. While the effects of instrumental parental controls, such as parental management strategies, on drug use varied across individuals, parental expressive controls, such as adolescents’ attachment to parents, had uniform effects in reducing drug use. Compared to other racial and ethnic groups, parental influences on drug use were strongest for Caucasian students. The authors did not find any significant effects of gender and commitment to school on drug use.

Based on the results from 74 published and unpublished manuscripts on 55,537 subjects, Hoeve and his colleagues (2012) performed a meta-analysis to investigate the link between attachment to parents and delinquency and examined the potential moderating effects of age and gender. They found that poor attachment to parents was significantly linked to delinquency in male and female adolescents. Compared to attachment to fathers, a stronger effect was found for attachment to mothers. Age of the participants moderated the link between attachment and delinquency, having larger effects in younger participants. The researchers concluded that adolescents’ attachment to parents should be considered as an important policy implication in order to reduce or prevent delinquent behaviors. Overall, it is not difficult to find empirical evidence for the conclusion that the quality of parental attachment is a significant predictor of adolescent delinquency (Higgins, Jennings, Marcum, Ricketts, & Mahoney, 2011).

In addition to adolescents’ attachment to parents, empirical studies have found that their attachment to school significantly reduces the likelihood of delinquency (Hirschi, 1969; Cao, Cao, & Zhao, 2004). Studies have found that adolescents are more likely to
engage in minor delinquent behaviors if their attachment to school and family is weak (Nakhaie & Sacco, 2009; Cao, Cao & Zhao, 2004; Payne, Gottfredson, & Gottfredson, 2003).

Lin and Dembo (2008) tested the applicability of an integrated model of deviance from social bonding theory and social learning theories on U.S. adolescents’ (between 12 and 17 years old) drug use. By focusing on several elements in social bonding theory - such as family bond, school bond, and school involvement – the authors hypothesized that these elements were significantly related to adolescents' substance use. Utilizing the National Household Survey on Drug Abuse (NHSDA 2001) interview data from 68,929 individuals, they found that adolescents are more likely to use various drugs when they have lower social control through family and school. Several studies focusing primarily on the relationship between adolescents’ attachment to school and their delinquent behavior reported that such attachment reduces engagement in delinquency (Hirschi, 1969; Cao, Cao, & Zhao, 2004; Henry & Slater 2007; Demanet & Van Houtte, 2011). For example, Henry and Slater (2007) examined the effects of individual students’ level of school attachment as well as the contextual level of school attachment on their alcohol-related behaviors.

Utilizing the National Center for Educational Statistics database, the authors collected data on 4,216 male and female students from 32 middle/junior high schools across the United States. Results from their multilevel models indicated that student’s level of attachment to school is a predictor of recent alcohol use, intention to use alcohol, and aspirations consistent with alcohol use. Although the social context of adolescents’ school environment plays an important role in determining their behavior, in light of the non-random sampling of U.S. schools, these conclusions were restricted to non-metropolitan school districts.
Bergin and Bergin (2009) examined whether students’ attachment to parents influences their school success. The authors focused on enhancing the teacher-student relationships, drawn from results of prior studies (Jacobsen & Hofmann 1997; Pianta & Harbers 1996). Similarly, Cunningham (2007) examined risk factors related to adolescents’ bullying behavior. The author expected that bullies, victims, and bullies/victims would report no or low levels of bonding to school. Utilizing data collected from 287 females and 230 males attending Catholic schools, although there were different magnitudes among the three groups, Cunningham found that bullies, victims, and bullies/victims all felt a lack of attachment to school.

Hirschi’s (1969) social bonding theory is supposed to be equally applicable across all racial and ethnic boundaries (Junger-Tas & Marshall, 1997). For example, regarding the generalizability of social bonding theory, Hirschi contends in Causes of Delinquency that “there is no reason to believe that the causes of crime among Negroes are different from those among Whites” (p. 79). Although Hirschi provides empirical support for Whites only in his book, many studies have tested social bonding theory across various racial and ethnic groups. Overall, many studies conclude that the impact of social bonding factors on crime and delinquency are very similar across different ethnic groups (Austin, 1978; Cernkovich & Giordano, 1992; Junger-Tas 1992). However, according to Kempf (1993), the empirical evidence (in 1993) of social bonding theory does not provide a consistent answer to the question of whether and how the key elements of the theory are invariant across different racial and ethnic groups. This dissertation contributes to this debate by assessing whether the concepts of social bonding theory provides an explanation of delinquency across different cultural settings.
Because Hirschi (1969) proposes that attachment is generally found as a universal aspect of the human experience (Bowlby, 2007), there should be a link between the parent-adolescent relationship and delinquency across different countries and cultures. However, most studies have examined the effects of parental attachment on adolescent delinquency using samples collected in the United States. Arnett (2006) recognized that over 98 percent of developmental research has been conducted in the United States. Researchers have evaluated hypotheses derived from the social control perspective in Australia (Mak 1990; Mak 1991), Canada (Le Blanc 1994), Belgium (Demanet & Van Houtte, 2011), and Puerto Rico (Rodriguez & Weisburd 1991).

Social control theory has also been tested in East-Asian countries, including the Philippines (Shoemaker, 1994), the People's Republic of China (Zhang & Messner, 1996) and Hong Kong (Lau & Leung, 1992; Cheung, 1997). Cheung (1997), for example, examined the impact of selected family variables, school variables, peer variables, and media variables on adolescents’ deviant behavior, based on 1,139 students living in Hong Kong. Zhang and Messer (1996) examined the effects of school attachment on the likelihood of being an officially sanctioned delinquent, using data for a sample of youths in the People's Republic of China. The authors adopted an integrated model derived from social bonding theory, differential association theory, and social learning theory. Consistent with research and theorizing in the West, they found that strong school attachment reduces the likelihood of exposure to delinquent peers, which itself is an important determinant of delinquency. They emphasized the applicability and generalizability of criminology theories developed in one cultural background into another sociocultural context, suggesting Western criminological theory can indeed be applied to East-Asian contexts.
Utilizing the ISRD2, Posick and Rocque (2014) tested whether individual levels of family bonding and macro levels of perceived importance of the family are related to victimization in 30 countries. They suggest that exposure to victimization and the effects of family bonding vary, depending on the cultural contexts of the importance of family. Ling Ren (2015) used the ISRD2 to study whether attachment to significant others (parents, school, and neighborhood) was related to last-year versatility and life-time versatility between Chinese and American adolescent samples. Although their priority was targeted to test for invariance of attachment measures between Chinese and American samples, after they found mixed results in invariance testing, they conducted OLS regression analyses, which indicated that measures of attachment to significant others were strong predictors of Chinese and American adolescents’ versatility. Finally, Junger-Tas and colleagues (2012) included social bonding variables (i.e., attachment to parents and school) in their analysis of the 29 country ISRD2 survey data and found relatively strong support for social bonding variables as a correlate of self-reported delinquency.

Self–Control Theory

Closely related to social bonding theory is the more recently developed general theory of crime often referred to as self-control theory (Gottfredson & Hirschi 1990). Gottfredson and Hirschi (1990) consider criminal behavior to be one type of human behavior based on cost-versus-benefit considerations. As such, they define crime as “acts of force or fraud undertaken in pursuit of self-interest” (p.15). According to them, people generally make very rational decisions to maximize benefits and pleasure as well as to minimize cost and pain. Thus, given that criminal behavior is just a pattern of behavior to increase one’s benefits and pleasure, they insist that crime does not require any motivation.
The central concept of the theory is self-control, defined as “the differential tendency of people to avoid criminal acts whatever the circumstances in which they find themselves” (p. 87). According to Gottfredson and Hirschi (1990), individual differences in crime and deviant behavior depend on differences in self-control. Based on their definition of crime and low self-control, they contend that those who have lower levels of self-control are more likely to pursue the immediate pleasure of criminal behavior.

Individuals with low self-control tend to engage in criminal and deviant behavior, focusing on the short-term pleasure of that behavior. In light of their lack of long-term consideration about the consequences of behavior, from their perspective, crime and analogous acts are immediately gratifying, simple, and exciting. In their theory, Gottfredson and Hirschi (1990) assume that people who engage in criminal and analogous behavior share similar personal characteristics. They also contend that individuals with low level of self-control are impulsive, prefer simple tasks rather than complicated ones, pursue risk-seeking activities, prefer physical tasks rather than mental tasks, easily lose their temper, and are more self-centered (p. 90). On the other hand, people with high level of self-control are more likely to consider long-term consequences of behavior and are able to resist the opportunity to engage in crime and deviant behavior.

Gottfredson and Hirschi (1990) assume that people are naturally born with the tendency to pursue crime and deviant behaviors in light of their inherited self-interest. Thus, a central mission of criminologists, according to Gottfredson and Hirsch is to discover how people develop self-control. Gottfredson and Hirschi (1990) emphasize the importance of effective parental socialization during early childhood to develop an individual’s self-control (pp. 94 – 107). Based on this general theory of crime, parents play
an important role in instilling high levels of self-control in their children. To accomplish this, according to Gottfredson and Hirschi, parents must (1) monitor their children’s behavior, (2) recognize their children’s deviant behavior when it occurs, and (3) effectively and persistently punish their children’s deviant behavior. If parents follow these rules, their children will not commit delinquent or criminal behavior during adolescence and adulthood.

Gottfredson and Hirschi (1990) emphasize the generalizability of their general theory of crime, claiming that, regardless of an individual’s demographic characteristics, low self-control is a predictor of “all crime, at all times” (p. 117). Their “invariance thesis” claims that low self-control should have a strong effect on criminal involvement, regardless of individual characteristics such as age, gender, race/ethnicity, culture, and even nationality. Overall, prior empirical studies have supported their thesis, including age invariance (Tittle et al., 2003), gender invariance (Burton, Cullen, Evans, Alarid, & Dunaway, 1998; LaGrange & Silverman, 1999), and race/ethnicity invariance (Morris, 2006). Focusing only on mean differences across various groups, prior empirical studies have tested Gottfredson and Hirschi’s (1990) thesis. However, there is only limited research that tests the measurement invariance of self-control across different countries. The present dissertation will fill this gap.

Although self-control is the central concept of their theory, Gottfredson and Hirschi (1990) claim that low self-control is not the only factor that influences an individual’s criminal and deviant behavior. They declare, “Although we argue that self-control is a general cause of crime, we do not argue that it is the sole cause of crime” (p. 140). Lack of self-control is not a sufficient cause of crime. They emphasize the importance of
opportunity for explaining individual difference in criminal behavior. According to the authors, self-control can be criminally exposed, when there is an "obvious opportunity" for them (p. 269).

Although Gottfredson and Hirschi (1990) assume that opportunity influences the relationship between self-control and crime, Barlow (1991) argues that the authors neglect to provide an exact theoretical causal linkage between low self-control, opportunity, and crime.

_Unfortunately, Gottfredson and Hirschi do not develop the opportunity side of their theory sufficiently well to predict which of all these varied acts individuals are likely to commit (at a high or low rate) at any given time, or when they might switch from one crime to another or from crime to a noncriminal but analogous act. Nor do they provide a basis for deducing what kind of social or cultural setting would experience a high (or low) rate of any particular crime or analogous act. Their treatment of these issues as theoretically irrelevant or inconsequential hardly lessens the theory's vulnerability to attack (p. 237)._ 

Thus, the influence of opportunity in the causal relationship between self-control and crime is still a theoretical question within self-control theory, and some researchers claim there is a need to review the interaction between self-control and opportunity (Grasmick et al., 1993; Cochran et al., 1998; Longshore & Turner, 1998). It should be noted that, in the current dissertation, opportunity (measured through exposure to deviant peers) will be included as part of the theoretical model. This will be discussed in more detail in the next section.

To test self-control theory, researchers in criminology have developed and used mainly two measurements: attitudinal measures and behavioral measures. Although both measurements of self-control can predict criminal behavior with similar explanatory power (Pratt & Cullen, 2000), there are debates on the operationalization of self-control. Empirical assessments using attitudinal scales (Grasmick et al., 1993) reflect an individual’s personality inventories that Gottfredson and Hirschi (1990) specified with the six elements
of self-control. On the other hand, behavioral measures (Keane et al., 1993) capture an individual's imprudent acts that reflect his or her level of self-control. Although Gottfredson and Hirschi (1993) argue that behavioral measures of self-control are preferable over an attitudinal scale, behavioral measures have tautological problems. For instance, low self-control behavior was predicted by low self-control.

Based on the elements of self-control explained by Gottfredson and Hirschi (1990), Grasmick, Tittle, Bursik, and Arneklev (1993) designed a 24-item scale to capture internal traits of self-control. They constructed four items to measure self-control, based on the self-control theory's six underlying dimensions: impulsivity, simple tasks, risk seeking, physical activities, self-centeredness, and temperament. This scale has been accepted as the most widely used measurement of self-control in the field of criminology (Pratt & Cullen, 2000; Tittle et al., 2003; Delisi et al., 2003). The current dissertation uses an abbreviated version of this scale.

Much research has been conducted to examine whether low self-control is associated with an individual's engagement in a wide variety of crime and delinquency. Prior empirical research has indicated that people with lower levels of self-control are more likely to commit violent crime (Piquero, MacDonald, Dobrin, Daigle, & Cullen, 2005; Sellers, 1999), property crime (Longshore, 1998; Longshore & Turner, 1998), and drug-related crime (Ribeaud & Eisner, 2006). Individuals with lower levels of self-control are also more likely to download software illegally (Higgins, Wolfe, Marcum, 2008) and drive a car under an intoxicated condition (Keane, Maxim, & Teevan, 1993). The results that Pratt and Cullen (2000) obtained from a meta-analysis of 21 studies conducted ten years after the inception of the theory indicate that low self-control is "one of the strongest known correlates of
crime” (p. 952). A more recent meta-analysis conducted by the Max Planck Institute for Research on Collective Goods (2012) also found that almost 88 percent of the studies analyzed (n = 717) supported Gottfredson and Hirschi’s (1990) theoretical proposition. However, when subjects’ age, race, and gender were analyzed, the results suggested that these factors may influence the relationship between self-control and delinquent behavior.

Wood et al. (1993) also used a cognitive measure of self-control to predict high school students’ delinquent behavior. The students’ risk taking and temperament have been used to measure their level of self-control, and risk-taking factors were found to be the best predictor. To test the validity of the Grasmick et al.’s (1993) self-control scale, Longshore, Turner, and Rand (1996) examined the relationship between self-control and several types of crime committed in the past six months. Utilizing the data from a multi-site evaluation of the Treatment Alternatives to Street Crime (TASC) program, the authors found that low self-control had a significant and positive relationship with crimes such as fraud and crimes of force. Among all elements of self-control, they found risk-seeking, impulsivity, physical activities, and volatile temper had the strongest explanatory power to predict both crime types. In subsequent research, Longshore and Turner (1998) found similar results using the same sample.

Wolfe, Reisig, and Holtfreter (2015) investigated whether low self-control theory can explain self-reported criminal activity in late adulthood. Utilizing cross-sectional survey data from telephone interviews with individuals aged 60 years and older in Arizona and Florida (N = 2,000), the authors examined whether low self-control is related to criminal activity. Although it has been assumed that criminal activity ramps up during adolescence then peaks in the late teens and early 20s, involvement in crime continues to occur into
middle age and late adulthood (Piquero, Farrington, & Blumstein, 2009). In addition, others found that the effects of self-control on criminal activity persist when potentially mediating variables are included in the models (McGloin & Shermer, 2008; Reisig, Wolfe, & Pratt, 2012). Relying on Ribeaud’s (2006) findings that risk-seeking behavior and impulsivity are salient components of attitudinal self-control scales, the authors adopt an attitudinal approach to examining an individual’s self-control. From the models, they confirmed that low self-control is positively and significantly related to criminal activities in samples of adults too.

As an alternative to cognitive scales, behavioral scales have also been used to measure self-control (Evans et al., 1997; McGloin, Pratt, & Maahs, 2004; Polakowski, 1994; Pratt, Turner, & Piquero, 2004; Simpson & Piquero, 2002; Tangney, Baumeister, & Boone, 2004; Turner, Piquero, & Pratt, 2005; Wright & Beaver, 2005). As the first study using this behavioral scale, Keane, Maxim, and Teevan (1993) constructed several behavioral measures of self-control. Conducting secondary analysis and utilizing data from the 1986 Ontario Survey of Nighttime Drivers, the authors intended to examine whether driving under the influence (DUI) was influenced by risk-taking behavior. To measure self-control, they asked whether the subjects were wearing a seatbelt and whether anyone had tried to keep the subjects from driving. They also found that their scale could predict accurately whether or not an individual would drive under the influence. At the same time, Polakowski (1994) recommends that researchers must pay careful attention to the difference between the measure of self-control and the measure of delinquency.

Polakowski (1994) combined 19 behavioral and cognitive items to create a measure of self-control. He found that both behavioral and cognitive measurements of self-control
could accurately predict the number of times a subject had been convicted. Evans et al. (1997) used a mixed self-control scale to examine adult criminal activity and concluded that “self-control is an important predictor of criminal behavior” (p. 491). Furthermore, they added that “the behavioral scale was found to better predict delinquency than the cognitive scale” (Evans et al., 1997). The majority of studies testing self-control theory have found that the cognitive scale of self-control had a significant impact on predicting criminal activity (Piquero & Rosay, 1998; Longshore & Turner, 1998). Using a modified Grasmick scale to measure self-control after four items were removed, Piquero and Rosay (1998) found that self-control theory could predict crimes of force and fraud.

As is clear from the preceding discussion, many studies have tested the self-control theory’s key propositions. Overall, the findings are generally supportive of the theory’s claim that low self-control is a significant predictor of deviant behavior in youths (Baron, 2003; Burt et al., 2006; Burton, Cullen, Evan, Alarid, & Dunaway, 1998; Evans, Cullen, Burton, Dunaway, & Benson, 1997; Forde & Kennedy, 1997; Grasmick, Tittle, Bursik, & Arneklev, 1993; Hay, 2001; Hope & Chapple, 2005; Marshall & Enzmann, 2012; Paternoster & Brame, 1998; Polakowski, 1994; Pratt & Cullen, 2000; Unnever, Cullen, & Pratt, 2003; Vazsonyi, Belliston, & Van Loh, 2004; Vazsonyi, Pickering, Junger, & Hessing, 2001).

Any theory of crime which proposes to be a “general theory” should not be influenced by culture. One of the most daring propositions of the self-control theory is that a low self-control-deviance relationship exists across cultural and national boundaries. Gottfredson and Hirschi (1990) claim that their theory may be applied to various cultural settings either within countries or across countries as a “culture-free” theory, contending that “cultural variability is not important in the causation of crime, that we should look for
constancy rather than variability in the definition of and causation of crime... and the general theory of crime can encompass the reality of cross-cultural differences in crime rates” (pp. 174 – 75). Thus, the predictive power of self-control on delinquency may be manifested across various cultural settings (Cheung & Cheung, 2007).

Consequently, Gottfredson and Hirschi’s causal mechanism – which claims that the lower an individual’s self-control, the more likely he or she may have to be involved in criminal or “analogous” behaviors – is a universal application transcending demographic groupings, cultural heritage, and national boundaries. This premise encourages the testing of the generalizability of the key postulates of the self-control theory in different national contexts. Research testing the relationship between self-control and crime has found support for its main hypothesis across various cultural settings (Vazsonyi, Pickering, Junger, & Hessing, 2001; Vazsonyi, Wittekind, Belliston, & van Loh, 2004; Marshall & Enzmann 2012).

Testing this general proposition has taken place in a variety of settings and designs. A large amount of comparative research has been conducted in a single Western country, including the USA (LaGrange and Silverman, 1999; Teevan & Dryburgh, 2008; Caspi et al., 1994; LaGrange & Silverman, 1999; Romero, Gomez-Fraguela, Luengo, & Sobral, 2003; Tittle & Botchkovar, 2005; Vazsonyi, Clifford, Wittekind, Belliston, & Van Loh, 2004; Vazsonyi, Pickering, Junger, & Hessing, 2001). However, the theory has also been tested in a non-Western country (Cheung & Cheung, 2007; Hwang & Akers, 2003), in several Western countries (Tittle & Botchkovar, 2005; Svensson, Pauwels, and Weerman, 2010), in several non-Western countries, and between Western and non-Western countries (Vazsonyi et al, 2001, 2004).
Rebellon, Straus, and Medeiros (2008) assessed whether Grasmick et al.'s (1993) six dimensions of the self-control scale are related to violent and property crimes among young adult respondents across 32 Western and non-Western countries. The authors intended to test whether the scale is comparable across Western and non-Western countries, and whether the scale is significantly associated with violent and property crime, the degree to which macro-level cultural forces influence criminal behavior and self-control. Because the theory was developed in a Western cultural background, the authors wanted to test the validity and reliability of the self-control measures in non-Western settings, and they wanted to test Gottfredson and Hirschi’s (1990) assertion that macro-level cultural forces have little or no influence on criminal behavior. Rebellon, Straus, and Medeiros (2008) used HLM to confirm whether aggregate parental neglect factors influence self-control. The authors utilized the data collected from university students in 32 different national settings within the International Dating Violence Research Consortium 2004 (IDVS). After the authors tested the reliability of the six-item self-control scale in each of the 32 countries by using confirmatory factor analysis, tests were conducted to examine the degree to which average levels of parental neglect had an impact on the levels of self-control. Overall, they found that the self-control scale was reliable across countries. They also found that the scale in IDVS was associated with a significant degree of violent and property crimes in all 32 national settings. Consequently, this research confirmed that self-control theory may be applied to both Western and non-Western cultures, and offered a challenge to test the theory with various macro-level factors.

In criminology, more recently the generalizability of the general theory of crime has been tested empirically utilizing the ISRD2 data (Marshall & Enzmann 2012; Podaná &
Podaná and Buriánek tested the effect of self-control on self-reported alcohol consumption using the ISRD2 across 25 European countries. Focusing on different degrees of social tolerance of juvenile drinking and alcohol availability across countries, the authors hypothesized that the macro-level social tolerance of juvenile drinking and the availability of alcohol for juveniles would moderate the link between the effects of self-control and problematic drinking. Their results confirmed the expected effects of self-control on problematic drinking (binge drinking, regular drinking, and risky drinking) across countries. In addition, their first hypothesis – that the lower the social tolerance of juvenile drinking, the higher the effects of self-control on problematic drinking – was supported by the results.

Steketee, Junger, & Junger-Tas (2013) investigated whether risk factors derived from four theoretical approaches – social bonding theory, self-control theory, routine activities theory, and social disorganization theory – are related to delinquency, focusing especially on general differences between males and females. Utilizing the ISRD2 from 30 countries, the authors expected that there would be gender differences in delinquency, and variables derived from the four theories would be equally relevant predictors of delinquency in both genders. They found that self-control measures were strongly related to delinquency in males, but not for females. Marshall and Enzmann (2012)

**Lifestyle & Routine Activities Theory (LRAT)**

Because of the importance of opportunity, the current chapter will also discuss Routine Activity Theory (or opportunity theory) in more detail. Like lifestyle-exposure theory, routine activities theory was developed to explain the circumstances of criminal
victimization rather than to explain why individuals are motivated to engage in crime (Cohen & Felson, 1979). In addition, they developed the theory to explain the increase in the crime rate between 1947 and 1974 in the United States. Individuals' “routine activities” are defined as “any recurrent and prevalent activities which provide for basic population and individual needs, whatever their biological or cultural origin” (p. 593). The central premise of their theory is that an individual’s routine activities – such as going to work, school, and doing everyday activities – influence criminal victimization and illegal behavior. They argue that the changes in individuals’ routine activities after World War II influenced the crime rates, affecting the “convergence in space and time of the three minimal elements of direct-contact predatory violations: (1) a motivated offender, (2) a suitable target, and (3) the absence of capable guardianship (p. 589). They contend that a crime is most likely to occur when a motivated offender intersects a suitable target in time and space in the absence of capable guardianship.

The first element in routine activities theory, the motivated offender, refers to individuals who have an inclination to commit an illegal act. According to the theory, motivated offenders exist everywhere, and an individual’s criminal motivation is constant. While most theories of crime attempt to explain why offenders are motivated to commit crime, routine activities theory focuses on the offender’s opportunity influencing his or her motivation. In other words, offenders commit crime when they find a suitable target without a capable guardian. Given that the theory does not emphasize an offenders’ motivation to commit crime, the first element of the theory that must be measured is the concept of proximity, as suggested by Cohen et al.’s (1981) extended and refined routine activities theory.
The second element of routine activities theory is the presence of a suitable target, which can be an item or individual viewed as attractive to motivated offenders. Target suitability, especially for items, can be determined in terms of the target’s Value, Visibility, Accessibility, and Inertia, known as VIVA (Cohen & Felson, 1979). Recent researchers have added more elements, including other sets of attractive characteristics, such as Concealable, Removable, Valuable, Enjoyable, and Disposable (Clarke, 1999).

The final element that Cohen and Felson (1979) identify in routine activities theory for victimization is a capable guardianship. Thus, a suitable target without a capable guardian is more attractive to offenders. Guardianship refers to the extent to which a suitable target is protected by a person or item from a motivated offender. Guardianship consists of formal controls and informal controls. Specifically, formal guardians include individuals (such as police) and self-protection items (such as alarms, fences, and CCTV). In addition, informal guardians are ordinary citizens’ routine activities to look out for one another. Later, Felson (1994) focused more on informal mechanisms, contending “quiet and natural method by which people prevent crime in the course of daily life. This control occurs as people bring out the best in one another” (p. 78).

Cohen and Felson’s (1979) theory, focusing on circumstances for criminal opportunities, is essentially similar to Hindelang et al.’s (1978) lifestyle-exposure theory. However, the latter is an individual theory of victimization, while the former is an aggregate-level theory. Combining theoretical concepts from both theories, Cohen, Kluegel, and Land (1981) designed the Lifestyle/Routine Activities Theory (LRAT) to provide a more comprehensive theoretical framework for understanding the risk of criminal victimization. They suggest four concepts – exposure to crime, proximity to crime, target
attractiveness, and guardianship – to explain an individual’s opportunity for the risk of criminal victimization.

According to Cohen, Kluegel, and Land (1981), *exposure* can be defined as the “physical visibility and accessibility of persons or objects to potential offenders at any given time or place” (p. 507). Same as the concept proposed by Hindelang et al. (1978), the LRAT contends that individuals putting themselves into risky situations are more likely to be exposed to potential offenders, which in turn increases the risk of being victimized (Miethe & Meier, 1990; McNeely et al, 2014). The risk of being victimized is increased when individuals live and stay closer to potential offenders (McNeely, 2014). Cohen, Kluegel, and Land (1981) define *proximity* as “the physical distance between the areas where potential targets of crime reside and where relatively large populations of potential offenders can be found (p.507). For example, living in areas where high crime rates are normal increases the risk of being victimized, given that potential targets of crime and potential offenders are more likely to converge in time and space simultaneously.

The third concept proposed in the LRAT is target attractiveness, defined by Cohen, Kluegel, and Land (1981) as the “material or symbolic desirability of persons or property targets to potential offenders” (p. 508). This concept has been measured by individuals’ current economic conditions, including ownership of expensive goods and possession of cash (Sampson & Wooldredge, 1987; Lynch & Cantor, 1992; Miethe & McDowall, 1993). Cohen, Kluegel, and Land (1981) contend that target attractiveness must be considered separately depending on the motivation of potential offenders. Target attractiveness for instrumental crime must be related to a target’s desirability that the offender aims to obtain. On the other hand, attractiveness for expressive or interpersonal crime should be
related to an offender’s purpose to hurt and attack. Another concept in the LRAT’s framework is guardianship, defined as the effectiveness of persons (e.g., residents in neighbors, security guards, and police) and objects (e.g., alarms, fences, and CCTV) to prevent criminal incidents from occurring.

Cohen, Kluegel, and Land (1981) assert that individuals’ level of exposure, proximity, target attractiveness, and guardianship influence their risk of criminal victimization. The lifestyle/routine activities theoretical framework has been tested and supported empirically for a wide range of criminal victimization, including violent victimization (Bouchard, Wang, & Beauregard, 2012; Bunch, Clay-Warner, & Lei, 2015), property victimization (Peguero, Popp, & Koo, 2015), sexual victimization (Fisher, Daigle, & Cullen, 2010; Tillyer, Wilcox, & Gialopsos, 2010), consumer fraud victimization (Holtfreter, Reisig, & Pratt, 2008; Pratt, Holtfreter, & Reisig, 2010), and cybercrime victimization (Holt & Bossler, 2008).

It seems that researchers of the LRAT assume that their propositions are universally applicable. According to Cohen and Felson (1979), the core contention of the LRAT is that three elements must be met for crime to occur: presence of motivated offenders, presence of suitable targets, and an absence of capable guardianship. Based on Karstedt’s (2001) contention, the routine activities theory is best fitted for cross-cultural criminology research because all three theoretical elements are determined by cultural values and practices. In addition, he contends that the pattern of offenders’ motivation, victims’ routines of daily life, and practices of formal and informal control are firmly planted in the cultural background of any human society. Thus, the theory’s capability for allowing cultural variability enables criminologists to apply it to various cultural settings.
The LRAT proposes mechanisms to show how individuals’ routine activities lead to situations in which they are prone to victimization experiences. Prior studies have tested the theory utilizing data collected in the United States (Smith et al., 2000; Holzman, Hyatt, & Dempster, 2001; Plass & Carmody, 2005; Daday, Broidy, Crandall, & Sklar, 2005). However, since victimization occurs not only in the United States, researchers have tested the theory in a cross-national perspective to study its generalizability.

Stein (2010) tested the LRAT across 47 developed and developing countries, mainly to determine whether criminal opportunities lead to victimization. Given that the LRAT enables the consideration of micro- and macro-level approaches to understanding victimization, the author applied this framework to cross-national studies. Utilizing the International Crime Victimization Survey (ICVS) and the European Survey on Crime and Safety (EUICS) for individual-level measures incorporated from other sources - including the United Nations (UN), World Bank, and the International Labor Organization – for country structure, the author examined whether individual-level risk factors and country-level structure factors were related to violent and property victimization. For structural-level characteristics, she used the human development index (HDI), the educational component of the HDI, the component of life expectancy, and the wealth component from the GDP per capita. And for individual-level factors for the routine activities perspective, she used several variables in terms of individuals’ daily routine activities, asking how often respondents go out for leisure activities and whether they work or attend school. Results from hierarchical linear models indicated that individual’s lifestyles and structural elements were differentially related to victimization. Especially, the author confirmed the
LRAT’s contention that activities outside of the home increased opportunities for both violent and property victimization.

Uludag, Colvin, Hussey, and Eng (2009) attempted to combine theoretical models from modernization, inequality, and lifestyle and routine activities and tested their model on household property crimes across 42 countries. They utilized the International Crime Victimization Survey (ICVS) collected in 2000, with 72,367 survey respondents in 42 countries. The dependent variable was household property crimes, including pickpocketing, robbery, assaults, and sex offenses. The independent variables were level of democracy, economic development, world system status, and inequality for the structural level. Individual demographic characteristics were related to lifestyle and routine activities. The authors expected that macro- and individual-level variables could predict the occurrence and intensity of household property crime victimization. Overall, results from zero-inflated negative binomial regression models indicated that world system status and marriage significantly predicted the occurrence and intensity of victimization across various countries.

Both studies above highlight the importance of the LRAT for understanding opportunities of victimization in a cross-national perspective. It has been shown that the LRAT’s propositions can incorporate micro- and macro-level analyses. Prior studies focusing on micro-level analysis indicated that individuals who go out of their home at night faced increased risk of victimization (Arnold et al, 2008; Kennedy & Forde, 1990). In addition, the LRAT enables structural-level analysis, proposing a range of measures to represent structural opportunity in relation to victimization risk. Prior studies focusing on structural opportunity have found that structural-level measures of guardianship are
significantly associated with violent and property victimization risk (Bennett, 1991; Cantor & Land, 1985). However, few have tested the LRAT encompassing both individual- and macro-level of analyses within multi-level cross-national studies, to explore whether individual and structural measures are related to crime and delinquency.

**Institutional Anomie Theory**

The concept of “anomie” was first introduced by Emile Durkheim (1897). According to Durkheim, anomie refers to a state of normlessness in a society. Durkheim explains that the causes of societal normlessness derive from institutionally based strain. For instance, economic expansion or depression can cause high levels of anomie, and personal tragic events, such as the death of loved ones or getting a divorce, can also cause anomic states. Durkheim assumes that anomie is “in a persistent state within the economic realm of modern society” (1951/1897. p. 254). Durkheim (1951/1897) emphasizes the economic progression in modern society to explain the impact of social institutions on crime rates. When individuals’ prosperity and economic desire are increased by salaries, goods, and services, individuals in society may take temporal supremacy of economy over other social institutions.

Durkheim recognizes that economic dominance over social institutions in the modern capitalist society results in a state of deregulation. This occurs because industrialization reduces the connection between traditional social controls and individual’s needs and desires. Durkheim hypothesizes that the degree of integration of religious, domestic, educational, and political spheres is negatively related to crime rates in the society, and the more non-economic social institutions are integrated, the more social control is regulated over its members. However, modern economies are weakening these traditional
institutions. Under these conditions, Durkheim argued, “the only existing institution that could provide a social foundation for modern morality was education” (Ritzer, 2011, p. 217), assuming that education can provide individuals with the necessary physical, intellectual, and moral tools to function in a society.

Robert K. Merton (1938) is the first criminologist to develop a theory of crime based on the concept of anomie, adopting and integrating Durkheim’s ideas on social organization and anomie. Merton’s Anomie Theory provides a sociological explanation for how cultural and social structures interrelate across larger macro-level units. Durkheim and Merton share the assumption that human beings are “basically social and compliant under normal conditions” (Paternoster & Bachman, 2001, p. 141). However, when societies experience an anomic state, social conformity is deteriorated, which in turn causes their members to more likely become nonconforming and more likely to commit crime. Merton takes Durkheim’s notion “that ‘normal’ levels and forms of criminal activity in any society reflect the fundamental features of social organization” (Messner, Thome, & Rosenfeld, 2008, p.165). These “fundamental features of social organization” reflect the social structure and culture orientations of a society.

Although both scholars share similar beliefs about the place of conformity in social organizations, Merton’s Anomie Theory is quite different from Durkheim’s theoretical concepts (Agnew, 1997). Particularly in terms of its role in the social system, Durkheim argues that anomie is the state of failure to achieve goals that members of society aspire to achieve, which in turn leads to deviant acts (Agnew, 1997; Kornhauser, 1978). On the other hand, for Merton, although society generates universal and collective goals, in an anomic state, society fails to regulate the means that its members use to achieve the goals. In other
words, the failure of society to regulate means influences how people cope with institutional pressures generated by the macro-social environment. Therefore, according to Merton, anomie is the contradiction between a society’s culturally determined goals and the social structure’s or organization’s capability of regulating the means in the society. Culturally ascribed goals might create pressures or strains in the members of society to break the rules to achieve the goals, which sometimes lead to crime and deviance.

To understand the socio-cultural aspects of criminal and deviant behavior, Merton, like Durkheim, focuses on the elements of cultural and social institutions within the macro-level social organization. Merton contends that these two elements are “analytically separable although they merge imperceptibly in concrete situations” (1938, p. 672). Based on his perspective, culture is a combination of goals, purposes, and interests. In particular, culture is made up of a “frame of aspirational reference. These goals are more or less integrated and involve varying degrees of prestige and sentiment. Some of these cultural aspirations are related to the original drives of man, but they are not determined by them” (p. 672). Cultural structure is the integrated set of normative values regulating an individual’s behavior in a society that is commonly accepted by them. Accordingly, Merton’s Anomie Theory claims that crime and deviance is caused by a “cultural overemphasis on success combined with structurally limited opportunities” (Passas et al., 1997, p. 5).

On the other hand, social institutions encompass the social structure that define, regulate, and control its members’ accepted means of achieving goals (Merton, 1968). According to Merton, “Every social group invariably couples with institutional regulation of
accepted and required procedures for attaining goals. And the institutional norms limit the individual's choice of expedients” (1938, pp. 672–673).

These two elements determine whether societies are balanced or imbalanced. Imbalanced societies, Merton uses the term “mal-integrated societies,” are the states where the subcomponents of culture, such as socially accepted goals, norms, and means, are out of balance. Individuals’ means of achieving their goals are also mismatched with the realities of the social structure (Messner & Rosenfeld, 2009). In the typical example of a mal-integrated society, the United States, societal values in the cultural system give pressure to the all members of society to prioritize their emphasis on monetary success (Agnew, 1997). Specifically, Merton says,

... The pressure of prestige-bearing success tends to eliminate the effective social constraint over means employed this end. ‘The-end-justifies-the-means’ doctrine becomes a guiding tenet for action when the cultural structure unduly exalts the end and the social organization unduly limits possible recourse to approved means. (1938, p. 681).

Consequently, in highly anomic societies, high crime rates are a common phenomenon because culture in the anomic society does not emphasize institutionalized means to achieve individual goals any more as strongly as it should. It may often involve criminal activity.

As an important extension of Merton’s Anomie Theory, Steven Messner and Richard Rosenfeld (1994) published Crime and the American Dream. They propose an institutional anomie theory that expands upon Merton’s concept of anomie and synthesizes the theoretical concepts of social organization and anomie. Messner and Rosenfeld adopt Durkheim’s concept of anomie (2012, p. 88). In addition, they accept Durkheim’s notion that crime is a normal and general element of society, stating that “crime is normal, in a
word, because it is social, and it is no less social than conformity” (Messner & Rosenfeld, 1994, p. 51). They contend that a society without crime is not possible, and crime and deviance are necessary elements of society. They also agree with Merton’s idea that the concept of the American Dream is a unique phenomenon in the United States and does not exist in other countries. They refer to it as “a commitment to the goal of material success, to be pursued by everyone in society, under conditions to open, individual competition” (Messner & Rosenfeld, 2006, p. 68).

Messner and Rosenfeld, in their Institutional Anomie Theory, consider the concept of the American Dream embedded in Merton’s theory as an element of culture. They note, “American Dream itself exerts pressures toward crime by encouraging an anomic cultural environment, an environment in which people are encouraged to adopt an ‘anything goes’ mentality in the pursuit of personal goals” (1994, p. 68). They propose that four values lead individuals to attain the American Dream: achievement, individualism, universalism, and the fetishism of money.

Achievement, one of the most central concepts of the American culture, refers to the goal of individual hard work to attain success. Messner and Rosenfeld argue that in American society, what individuals have achieved in life is perceived “as a success to make any meaningful contribution to society at large” (1994, p. 70). The second value, individualism, arises from the unique emphasis in American society on individual rights and autonomy. Given that individuals set their goals by themselves, achievement and individualism are ultimately tied together, which in turn “exacerbates the tendency towards anomie” (p. 70). Any cultural values that can be universally embedded in society become the foundation of an individual’s social norms. Universalism relates to an
individual’s social norms to succeed, as determined by American culture. Messner and Rosenfeld also acknowledge that societal goals, such as success or failure, are universally determined in American society, noting that “anomic pressures associated with an individualistic achievement orientation permeate the entire social structure” (p. 71). Thus, monetary success leads to strain in individual members of American society. The final cultural value that characterizes the American Dream is the fetishism of money, which was renamed “pecuniary materialism” (Messner & Rosenfeld, 2012). This value is strongly related to the other three values and helps to bind them all together. Messner and Rosenfeld (1994) point out that an individual’s monetary gains are the primary means for measuring success in American society.

These four values of American culture form the basic principle of the American Dream (Messner & Rosenfeld, 1994, p. 71). In American culture, the more the pressure to succeed in society increases, the more conducive that society is to criminal behavior. Based on Merton’s notion of anomie embedded within culture, these four elements are important. Messner and Rosenfeld (1994) contend any society is in an anomic state (p. 88) when individuals get pressured to succeed without sufficiently legitimate means to attain the goals prescribed culturally. By expanding Merton’s concept of social structure, Messner and Rosenfeld contend that “social institutions are the building block of whole societies” (in Adler & Laufer, 2013, p. 171). Institutions are referred to as “relatively stable sets of norms and values, statuses and roles, and groups and organization’ that regulate human conduct to meet the basic needs of a society” (1994, p. 72).

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2 In a later work, the authors contend that social institutions are necessary for individual and collective survival of society, given that they enable society to endure over time. Thus, the level of institutional dependence among social institutions plays a role in society because institutions
Messner and Rosenfeld (1994) discuss three important social needs that social institutions provide: “adaptation to the environment, mobilization and deployment of resources necessary for the achievement of collective goals, and socialization of members to accept society’s fundamental normative patterns” (Messner and Rosenfeld, 1994, p. 72-73). The level of each social need aforementioned is working together to determine the strength of each social institution. Messner and Rosenfeld identified four key social institutions influenced by social needs: economy, polity, family, and education.

Among the four social institutions, economy most strongly supports the cultural values of the American Dream (Messner and Rosenfeld, 1994). They claim that adaptation to the environment is of primary importance because of the strong development of the economy in the United States. Given that cultural goals of monetary success in a given society may dominate society, (Merton, 1938; Messner & Rosenfeld, 2012), other social institutions serve the interests of the economy. For example, mobilizing and deploying economic resources are required to achieve monetary cultural goals. Socialization among members of society is also necessary for sharing the values of the normative patterns of capitalism.

Messner and Rosenfeld (1994) argue that when the economy in a society is emphasized over other institutions, the goals of monetary success increase, which in turn spreads acceptance of criminal motivation in society. According to their theory, dominance of the economy as a societal institution indicates “widespread anomie, weak social control, and ultimately, high levels of crime (p. 68). Under these circumstances, non-economic

have profound implications for the motivation and control of human social behavior, including criminal behavior” (Messner & Rosenfeld, 2012, p. 75).
institutional functions and roles are devaluated, other institutions accommodate economic requirements, and economic norms penetrate into other social institutions. An example of the devaluation of non-economic institutional functions and roles can be found in education. The purpose of education, acquiring knowledge and learning, is replaced by using education solely as the means to obtain monetary success. In addition, an example of the accommodation of other social institutions to economic requirements can be found in the lack of consideration given to parents after giving birth. In the United States, family roles are often secondary to the economic roles parents play. Politics provides another example of the penetration of economic norms into other social institutions. Politics normally endeavors to reduce societal costs whenever possible, but if politicians act with a business mindset, profitability will be emphasized in public policy over social welfare programs (Messner & Rosenfeld, 1994).

According to Messner and Rosenfeld, cultural and social structures should be interrelated and working together, which in turn can create the environment for particular forms of social behavior. In the institutional anomie theory, the relationship between cultural and social structures in the United States can explain crime rates.

At the cultural level, the dominant ethos of the American Dream stimulates criminal motivations and at the same time promotes a weak normative environment (anomie). At the institutional level, the dominance of the economy in the institutional balance of power undermines the vitality of non-economic institutions, reducing their capacity to control disapproved behavior and support approved behavior. (2007, p. 84)

Overall, Messner and Rosenfeld (1994) attempt to synthesize several concepts of anomie and social organization, derived from Durkheim and Merton. As a new macro-level criminology theory for serious crime, their institutional anomie theory extends the concepts of Merton’s anomie and accepts Durkheim’s. Messner and Rosenfeld focus on
aspects of social organization to adopt elements of cultural values and social institutions in a social structure. Furthermore, they attempt to synthesize all these elements in an international comparative context to explain variations in crime rates across countries. This comparative perspective of institutional anomie theory enables the theory to explain crime rates based on the levels of anomie, culture, and social institutions across countries.

Given that Messner and Rosenfeld (2007) contend the Institutional Anomie Theory (IAT) provides a good explanation of serious crime in America, many scholars have applied the IAT to violent, property, and white-collar crimes (Chamlin & Cochran, 1995; Messner & Rosenfeld, 1997; Hannon & DeFronzo, 1998; Savolainen, 2000; Batton & Jensen, 2002; Stucky, 2003; Maume & Lee, 2003; Schoepfer & Piquero, 2006).

As the first test of IAT’s main propositions, Chamlin and Cochran (1995) studied whether the effects of economic conditions on profit-related crime depend on the strength of non-economic institutions. In light of IAT’s macro-level explanation of crime, the authors examined the states’ in the US property crime rate, measured as the total number of reported robbery, burglary, larceny, and auto theft offenses per 1,000 people in 1980. For economic institutional measurement, the percentage of families living below the poverty level was used. For non-economic social institutions, divorce rates were used to measure family disruption, church membership rates to measure the strength of religion, and the percentage of voting-age persons who voted in congressional elections to measure the strength of the polity. Utilizing the measurements above, they hypothesized that the effects of economic conditions on property crime rates depended on the values of the non-economic institutions. Specifically, they tested whether low poverty rates reduced property crime rates when divorce rates are low, membership rates in religious organizations are
high, and participation rates in elections are high. The authors supported Messner and Rosenfeld’s proposition that when non-economic social institutions are strong, the impact of poverty on property crime rates is low.

Piquero and Piquero (1998) tested the IAT on property and violent crime, utilizing cross-sectional data from the U.S. in 1990. The authors intended to improve the theory by taking different operationalization of the commitment to three types of non-economic institutions. The poverty rate represented the dominance of the economy, while the non-economic institutions of the family were measured by the percentage of single-parent families. The strength of the polity was measured by the percentage of the population who voted in the 1988 presidential election and the percentage of state residents receiving any kind of government assistance or welfare benefits. Finally, institutions of education were measured as the ratio of teacher’s annual salary to that of other citizens, the percentage of individuals who did not complete high school, and the proportion currently enrolled in post-secondary education. After reviewing the poverty rate against non-economic institutions, the authors found that college enrollment moderated the positive relationship between the poverty rate and property crime. On the other hand, the education system and polity significantly attenuated the relationship between the poverty rate and violent crime. Overall, this research contributed to the testing of the IAT, expanding the scope of the theory to include both violent and property crimes.

Maume and Lee (2003) continued to test the institutional balance of power proposed by the IAT, expanding Chamlin and Cochran’s (1995) research theoretically and methodologically. Following Messner and Rosenfeld’s (1994) central tenet of the theory, Maume and Lee tested whether and how economic institutions may dominate other social
institutions. They also focused on the mediating and moderating effects of the strength of non-economic institutions on property crime rates. Instead of focusing only on property crime rates, the authors categorized data from the FBI’s Supplementary Homicide Reports into expressive and instrumental types, which allowed the theory to be applied to crime-specific analyses. Similar to Piquero and Piquero’s (1998) study, Maume and Lee measured the strength of the polity by the average voting percentage in the 1988 and 1992 elections. In addition, they measured the strength of commitment to the family by using the divorce rate in 1990. The dominance of the economy was measured by the Gini coefficient of economic inequality, found to be a significant predictor of violent and property crimes in many empirical studies (Blau & Blau 1982; Messner & Tardiff 1986). From the results based on negative binomial regression and cross-product interaction terms between the Gini coefficient and the five measures of the strength of non-economic institutions for moderating effects on crime, Maume and Lee (2003) found partial support for the IAT. Among other things, the Gini coefficient and divorce rate had a significantly direct positive effect on all three types of homicide.

Messner and Rosenfeld (2009) acknowledge that Merton was only interested in the United States and the “American Dream” during his time, rather than historical or comparative contexts. They believe Merton did not fully develop notions of social structure. They also believe Merton’s theory can be improved by including the historical context and various social institutions. The fact that, compared with any other developed nation in the world, the United States has the highest rate of homicide led them to consider comparative contexts with elements of the modernization thesis and the civilization process, including culture and social organization. Thus, Messner and Rosenfeld emphasized the comparative
context, arguing that crime rates need to be examined at the national and international levels. Based on their consideration of comparative contexts, criminological theories should be able to explain why one country experiences higher crime rates than another. For them, to explain variations in both long- and short-term crime rates, it is necessary to study culture from a comparative perspective. Messner and Rosenfeld (1994) contend that culture and social institutions should be considered in macro-level explanations of crime, by synthesizing aspects of society and social organization as well as historical assumptions of society. Originally, although their institutional anomie starts from contextual characteristics in the United States, Messner and Rosenfeld’s (1994) comparative context includes generalizability sufficiently enough to explain crime rates across different cultural settings. They acknowledge that conflict among social institutions emerges when disparity exists in cultural values. Given that social institutions are related, the interaction among them should be considered. To understand and examine the different levels and types of crime across countries, it is critical to understand the interaction among cultural values.

Culture is a macro-level social construct (Merton, 1938), as well as one of the components of the institutional anomie theory (IAT). Focusing on cultural values and institutional roles, the IAT is a macro-level theory that helps explain cross-national differences in criminal offenses and crime rates.

As the first cross-national assessment of the IAT, Messner and Rosenfeld (1997) tested their propositions by examining whether decommodification would vary negatively with homicide rates in 45 countries. They hypothesized that the higher the decommodification, the lower the homicide rate. In addition, when decommodification is low, the economy may dominate the polity, which in turn may increase serious crime rates.
Utilizing the natural log of World Health Organization (WHO) homicide rates per 100,000 people from 1980-1990 as the dependent variable, Messner and Rosenfeld developed a decommodification index based on several characteristics. The decommodification index is the sum of the z-scores of welfare expenditure as a percentage of the gross domestic product (GDP), the percentage of welfare spending for employment injuries, and welfare expenditure per capita. Given that a cross-national sample of data is effective for expressing variations in crime across countries, it is useful for capturing the institutional relationship between political and economic institutions. Supporting their theoretical proposition, Messner and Rosenfeld (1997) found a statistically significant negative correlation between the decommodification and homicide rates across the 45 countries.

Salvolainen (2000) also tested the IAT using the same cross-national data. The first sample contained the 45 countries' homicide rate variations as the dependent variable. Similar to Messner and Rosenfeld's (1997) assumption, a measure of decommodification, a measure of income inequality using Gini coefficients, economic discrimination, development index, and gender ratio were used as the independent variables. The second set of data contained several characteristics, due to the limited amount of data, from 32 countries. Disaggregated victimization rates were used as the dependent variable. Income inequality and social security spending were used as the independent variables (p. 1031). Overall, Salvolainen supported the IAT. Interaction terms for economic discrimination and decommodification, and the interaction terms for income inequality and welfare spending, were statistically significant in predicting homicide rates across countries. However, in light of a lack of measures for the non-economic institutions, this study is only a partial test of the IAT.
Jensen (2002) tested the IAT across countries because he found previous cross-national research testing it had methodological and theoretical limitations. He points out a lack of valid and reliable measures for the key concepts of the theory, no empirical support for the theory that society embraces the cultural goals posited, and a lack of other competing theories used as controls. Utilizing the World Values Survey data from 38 different countries, Jensen tested the theory, hypothesizing that the “United States should rank relatively high among countries in the importance accorded economic roles relative to other activities” (p. 58). Testing bivariate correlations among decommodification and the family, work, religion, and leisure, Jensen (2002) found that the measure for religion and the control variable of birth rates significantly predicted the logged homicide rates. In addition, Latin country, diversity, and per capita wealth were statistically significant predictors of homicide. Overall, although he found supportive evidence for the IAT, he concluded that the theory had serious limitations for explaining lethal violence and property crime (p. 69).

More recently, Bjerregaard and Cochran (2008) tested the IAT on the rates of homicide and theft across countries. The authors focused on the degree to which non-economic social institutions mediate and/or moderate the effects of the economy on the cross-national rates of crime. Utilizing the International Criminal Police Organization (INTERPOLE), the WHO, the UN, the World Bank, and other international sources from 1996, they attempted to clarify the causal mechanisms for the influence of economic dominance on crime rates. They examined how institutional anomie concepts were related to violent and property crime, how the key concept of economic dominance can be operationalized differently, and whether mediation and/or moderation works among the
dominance of economy, the effectiveness of non-economic social institutions, and crime across countries. Overall, their findings showed mixed results. Although countries with higher levels of economic inequality had higher rates of homicide, the explanatory power of their model’s theft rates was considerably stronger than that for homicides. In addition, as they expected, the ineffectiveness of non-economic social institutions both mediated the influence of economic deprivation and moderated its influences on the relationship between economic dominance and crime. Overall, they found inconsistent support for the IAT, depending on the units of analysis and types of crime. In addition, how to operationalize the economy is very sensitive issue.

Theoretical Integration in Criminology

Scientific theories and explanations answer to the commonly asked questions of why, by what process, and how does it work, and about real situations, feelings, experiences, and human behaviors (Akers, 2000). In addition, theory provides intellectual satisfaction as well as the means for predicting aspects of the phenomena of interest (Tittle, 1995). Although many theorists have suggested different definitions of what a theory is, the definitions have an overriding common element; theories make statements about the relationships between observable phenomena (Vold et al., 2002), a theory explains how two or more events are related to each other (Williams & McShane, 2004:2), and a theory is a set of propositions that explain how two or more events or factors are related to one another (Curran & Renzetti, 2007:2). The main goal of theory within any discipline is to explain phenomena (Krohn & Ward, 2015). Theory provides an account of why the observed relationship exists and to suggest hypotheses that might provide further support for the explanation (Krohn & Ward, 2015). In doing so, theory synthesizes large bodies of
knowledge as well as derives explanations of phenomena that previously have not been explained (Tittle, 1995).

Tittle (1995) suggests that “well-structured” theory or “fully adequate theory” must exhibit certain features. It must be logically organized, systematic, and manipulable in ways that will provide specific applications. In addition, Tittle (1995) introduces five desirable characteristics of good theory: actual explanations that satisfactorily answer questions of why and how, breadth, comprehensiveness, precision, and depth. The first and most important characteristic of good theory is whether the theory answers questions of why and how, which is explaining the causes of phenomena of interest. According to Tittle (1995), although theory does not provide explanations clearly, it provides broad paradigms for analyzing or thinking about phenomena, moral philosophies, classification systems for understanding, description of phenomena, and conceptualizations involving development of ideas of interest.

The second desirable characteristic of good theory is the capability to explain a variety of specific instances within certain phenomena (Tittle, 1995). That is, criminological theories should encompass all forms of crime and provide explanations of all aspects of crime-relevant phenomena. Of course, although no criminological theories cover all criminal behavior, theory must explain as wide a range of phenomena as possible for increasing degrees of success (Tittle, 1995). Comprehensiveness is the third feature of desirable theory. Comprehensiveness is the explanatory mechanism to understand causal processes within one way or another, and all the operative causes of the phenomena (Tittle, 1995). It is impossible that only one cause makes crime-relevant phenomena
happen. Thus, theory must take that complicated reality into consideration. Tittle (1995) suggests several ways to achieve comprehensiveness of adequate theory; understanding a central causal process that incorporates within itself various causal streams, identifying various contingencies for the operation of a main causal process, and integrating various causal processes through a structural arrangement of theoretical elements. Integrating shows how each element comes to bear on various other processes and outcomes.

Precision, as the fourth desirable feature of good theory, contains three different aspects of theory: specification, the form of theorized causal effects, and specification of causal intervals (Tittle, 1995). Specification deals with when and to what degree the causal forces laid out in the theory (Tittle, 1995). In addition, although theory implies more complicated forms of effects of among relevant variables, some complicated causal effects are not yet detailed in the theory. So, adequate theory should spell out the various forms of likely effects (Tittle, 1995). As the final aspects of precision, specification of causal intervals is necessary for good theory. And ideal theory must examine a causal variable produces the theorized outcome by recognizing the correct causal interval.

The final feature of adequate theory is depth. It refers to specification of how the concepts of the formulation fit together in sequences of effects and/or interactions (Tittle, 1995). The causes of crime, for example, we must understand an individual’s history and roots of social life. Then, the specification of complete causal chains that show the prior impact on all variables should be considered. Also, we should ask how the operative causal variables combine with each other in causally ordered sequences (Tittle, 1995).
According to Akers (2000), there are three principle ways to evaluate and develop theories: considering each theory on its own, theory competition, and theory integration. To evaluate the theory's prediction, results from data should support the theoretical proposition. If the theory is disconfirmed by the evidence, then it can be modified or discarded. Theory competition is the logical, conceptual, or empirical comparisons of two or more theories to determine which offers the better or best explanation of crime. On the other hand, theory integration can be defined as; the combination of two or more pre-existing theories, selected on the basis of their perceived commonalities, into a single reformulated theoretical model with greater comprehensiveness and explanatory value than any one of its component theories (Farnworth, 1989; 95).

According to Krohn and Ward (2015), theoretical integration can be conceptualized by two dimensions: the substance of theory and the form of theory. The substance of theory is consideration of types of ideas that are incorporated into an integrated perspective. For example, level of aggregation and cross-discipline integration can be referred as two elements of the substance of theory. The level of aggregation is the consideration whether theoretical integration occurs within the same level or across different levels (Krohn & Ward, 2015). In criminology, sometimes theory integration occurs at the same level of aggregation, while other times an integrated theory may borrow ideas from two macro-level theories. Recently, it has become popular to incorporate ideas from theories in terms of different levels of aggregation (Krohn & Ward, 2015). These integrated theories from different levels of aggregation identify the social context or the social structural characteristics different groups of people has. That is, these theories provide causal mechanism whether social processes will either mediate the relationship between the
social structural characteristics and criminal behavior or the social structural characteristics will serve to moderate the impact of the social process (Akers, 2009; Krohn & Ward, 2015). The cross-discipline integration is out of scope in the current discussion.

Theoretical integration takes several different forms. To understand how different ideas can be integrated, we should distinguish between conceptual integration and propositional integration (Krohn & Ward, 2015). Conceptual integration identifies similarities among the concepts that are employed by two different theories (Krohn & Ward, 2015). Although social control theory’s concept of belief and differential association theory’s concepts of definitions favorable and unfavorable to the violation of the law are conceptually different, there are similarities regarding people’s attitudes toward the law. On the other hand, Thornberry (1989:52) suggests that “theoretical integration is the act of combining two or more sets of logically interrelated propositions into one larger set of propositions to provide a more comprehensive explanation of a particular phenomenon”. That is, to integrate theory sufficiently, key theoretical propositions of theories should be integrated rather than a concept.

According to Travis Hirschi (1989), there are three different forms of propositional theory integration: side-by-side integration, end-to-end approach, and the up-and-down approach. Side-by-side integration is used when attempting to explain different aspects or types of crime within a unified theoretical structure, taking as an example from Moffitt’s taxonomic theory. As a second form of propositional integration, end-to-end approach deals with propositions from one theory are linked sequentially with propositions from another theory. One most often identified as an example of this type is Elliott et al’s (1979)
integrated theory (Krohn & Ward, 2015). Elliott and colleagues link elements from strain, social control, and differential association theory into a causal chain, suggesting that strain and social control lead adolescents to have more delinquent friends which, in turn, leads to delinquent behavior (Krohn & Ward, 2015). In the final type of propositional integration, there are distinct ways to achieve integration: theoretical reduction and theoretical synthesis (Krohn & Ward, 2015). Theoretical reduction (Nagel, 1961) can occur when one theory contains more abstract and general propositions than the other one. Burgess and Akers (1966) differential association-reinforcement theory can be identified as this type of approach. On the other hand, theory synthesis is the approach identifying a more abstract theory from two or more theories into a new theory (Krohn & Ward, 2015). Krohn (1986) synthesize the ideas from social control and differential association theory to form social network theory.

Although combining good ideas from different theories into one theory seems great having more explanatory power, not everyone agrees on the integration of criminological theories. In the field of criminology, both theory competition and theory integration have been vigorously defended respectively (Akers, 2000; Messner et al., 1989). Krohn and Ward (2015) indicated the two reasons for objections to integrating theories; the potential incongruity between assumptions of some of the constituent theories and the resulting complexity of integrated theories. When they explain the concerns about the conflicting assumptions among theories, they exemplified the integration of propositions from social control theory with those from a social learning perspective. The controversy comes from an epistemological assumption regarding the nature of humans (Krohn & Ward, 2015). Social control theory assumes that humans are rational beings trying to compare their
pleasure and their pain. Given that social control theory assumes humans are inherently possessing criminality, there is no need to suggest a motivation that pushes or pulls an individual to commit criminal behavior (Krohn & Ward, 2015). To account for why people do not commit criminal behavior, social control theorists address the sources of social control or constraints. On the other hand, the influence of peers in the learning of definitions and reinforcement makes criminal behavior more likely. Social learning theorists suggest that criminal behavior is caused by these influences (Krohn & Ward, 2015).

When we try to integrate these two theoretical assumptions, conflicting assumptions emerge. By integrating the two theories above, motivations from the push or pull of peer association are provided for deviant behavior. However, based on social control theory’s assumption, humans are rational and the provision of a motivating force is not necessary for deviant behavior. Consequently, these two theories cannot be truly integrated. This reason made Thornberry (1989) advocate theoretical elaboration rather than theoretical integration. He suggests that the true theory integration is difficult at best (Krohn & Ward, 2015). He argues that we should start from a theoretical base. Then we should allow empirical evidence to determine how to expand or elaborate based on the theoretical base.

Although it has not been discussed in the current dissertation, Tittle (1995) suggests as one of the key criterion in evaluating theories is parsimony. A parsimonious theory is simply more efficient, easier to test, and directs our attention to the truly important factors (Krohn & Ward, 2015). However, integrated theory adds variables, levels of analysis, and different types of deviance (Krohn & Ward, 2015). When we add a limited number of
variables from different theories and generate hypotheses among these into the integrated theory, we should add the complexities that the new theory introduces. In addition, without appropriate theoretical justification and explanation, integration increases complexity with less logical coherence. Cao (2004; 161) states “integration can lead to sloppy theorizing in which scholars pick a variable they like from one theory can then a variable from another, but they do not reconcile the philosophic differences behind there variables”.

In the field of criminology, scholars disagree about how theorists should deal with non-supportive evidence as well as how various limited theories should be developed through an integrative process (Tittle, 1995). Some theorists contend that the results of theory testing should be used to modify theories to make them more consistent with the evidence (Tittle, 1995). However, others theories can be developed by fixing in their original form (Hirschi, 1979, 1989). Hirschi (1989) is critical on integrative process because it ignores the assumptive differences of each theory, suggesting the combined theories might be contradictory or incompatible (Krohn & Ward, 2015). Social control theory, for example, to explain why individuals commit crime, is relying on weak or inadequate control by parents because humans are inherently gratifying. However, many other criminological theories attempt to explain criminal behavior based on the strength of motivation as a key element (Tittle & Paternoster, 2000). Given that motivation for crime cannot be both a constant and a variable simultaneously, integration of control-type and motivation-type theories makes no sense (Tittle, 1995).

Sometimes, seemingly, there are incompatible assumptions between various theories or even within specific theories raising questions about the possibility of integration (Tittle,
To explain this point, we should consider the theoretical integration known as redefined self-control, which is an amalgamation of social- and self-control theories (Hirschi, 2004). Given that the two distinct controls – social control (Hirschi, 1969) and self-control (Gottredson & Hirschi, 1990) begin with the underlying assumption that humans are inherently self-interested, criminologists need to explain why individuals refrain from engaging in criminal behavior. (Krohn & Ward, 2015). Although the precise meaning and sources of control are quite distinct, Hirschi (2004) revised his both theories as follow; self-control is the set of inhibitions and it may be initially described by going to the elements of the bond identified by social control theory (Hirschi, 2004: 543). That is, social bonds are stable, because he claims that social control and self-control are the same thing.

Although the redefined self-control might be seen as an up-and-down approach of integration encompassing both short-term and long-term costs of an act by redefined self-control, however, Hirschi’s theoretical integration may bring a bit of confusion (Krohn & Ward, 2015). While Hirschi assumes that social bonding levels and the tendency to consider the full range of costs of particular acts are similar, there has been a claim that the measure of redefined self-control was nothing more than an index of various social bonding items (Krohn & Ward, 2015). Although the Hirschi’s integration might be viewed as same-level end-to-end theoretical integration, it is necessary to accommodate the incompatible assumptions between the two control theories. In addition to this, we should also note that sometime we were forced to address some conflicting theoretical assumptions, for example, between social control theory and strain theories. Control theory explains crime based on the assumption that criminal motivation is innate and does
not require explanation, while strain theory suggests strain is the sole source of motivation to commit crime (Krohn & Ward, 2015). Either theoretical assumptions between internally motivated or strain as the motivation for offending should be dropped when we merge these theories.

Despite the several arguments about integrated theory’s complexities covered so far, it is necessary in our field because of this fact that humans behave in a complex way. By having one or two main themes, we might not adequately explain why we behave as we do. We might need a certain level of complexity to explain others’ deviant behavior. We should not exclude certain variables related either directly or indirectly to deviant behavior to escape from the level of complexity (Krohn & Ward, 2015). As we have considered, the first and primary goal of theoretical integration is to support new theory development and expand the existing theoretical propositions and concepts. The current dissertation is trying to integrate several theories including self-control theory, social bonding theory, and lifestyle/routine activities theory. Also, to understand whether the social structural characteristics will serve to moderate the impact of the social processes, we should consider how concepts from Institutional anomie theory can be added to this proposed theoretical integration. The incompatibility between control theories (social bonding versus self-control theory) and between control theories and strain theories is one of the first reasons why the current dissertation deals with these proposed theories. Also, the fact that the generality of the casual mechanisms proposed by each theory may be limited on cross-national research gives us alternative motivations to integrate the theories above.

The Current Study
This study explores whether adolescents’ individual level of self-control, attachment to significant others (parents, school, and neighborhood), and their lifestyle and risky routine activities can be integrated to explain their violent and property criminal behavior. The study also examines whether attachment and risky lifestyle mediate the relationship between individuals’ level of self-control and criminal behavior, and whether they moderate the relationship between the level of self-control and delinquency. Furthermore, this study explores whether country-level contextual characteristics derived from the IAT moderate adolescents’ individual-level characteristics related to criminal behavior.

The dissertation attempts to fill gaps in the debate on theory integration in criminology. By attempting to examine whether an integrated theoretical framework (of micro-level theories such as social bonding, self-control, and routine activities) has explanatory power to understand adolescent criminal behavior. Drawing on IAT, the dissertation further examines whether multi-level theoretical elaboration can be accomplished.

Based on integration of self-control and social bonding perspectives, there is little empirical work to confirm that the effects of self-control on crime is mediated by social bonds (Wright, Caspi, Moffitt, & Silva, 1999). Although studies have suggested that the relationship between low self-control and crime may be mediated by social bonding factors and association with deviant peers, such findings were based on a general population sample in the United States. The current dissertation tests attachment to significant others and delinquent peer associations as mediators on the relationship between the level of self-control and delinquent behavior. Because the effects of low self-control on delinquency have been mediated partially by peer influences (Conger, 1976; Evans et al., 1997; Krohn et
al., 1983), this mediation may help to explain the effects of self-control, attachment to significant others, and delinquent behavior.

Based on attempts to incorporate multiple theories simultaneously (Messner, Krohn, & Liska, 1989), researchers have investigated the extent to which attachment and risky lifestyle moderate the relationship between self-control and delinquency. While criminologists have found that crime and delinquent behavior are the results of the interaction between self-control and external factors (Wikström & Loeber, 2000; Wright, Caspi, Moffitt, & Silva, 2001), the results of the moderating effects of attachment and risky lifestyles have not been consistent. Some studies have found that external factors had a more influential effect with higher levels of self-control (Wikström, 2006), while others (Wright et al., 2001) proposed that individuals with low self-control have an elevated tendency to commit crime when they have delinquent peers. Thus, it is not clear whether association with delinquent peers and attachment to significant others strengthen or weaken the effects of self-control on criminal offenses. The seventh assumption, based on Messner and Rosenfeld’s (1994) IAT, is related to country-level contextual characteristics. It is assumed that country-level contextual characteristics play an important role in conditioning the effects of individual-level characteristics, as mentioned in the previous assumptions. Particularly, contextual characteristics within each country influence how individuals’ attachment to significant others, risky lifestyle and routine activities, and the level of self-control affect their criminal behavior. Based on this assumption that country-level contextual characteristics condition an individual’s risk factors, the dissertation focuses on one element of country-level contextual characteristic – the economy, among
the five elements listed by Messner and Rosenfeld: economy, education, polity, family, and religion.

**Research Hypotheses**

The dissertation examines whether individual-level predictors derived from three theoretical frameworks apply in equal measure to the explanation of adolescent delinquent behavior.

**Hypothesis 1:** Adolescents’ attachment to significant others is significantly related to their involvement in violent and property offending.

**Hypothesis 1a:** Adolescents’ attachment to parents is significantly and negatively related to their involvement in violent and property offending.

**Hypothesis 1b:** Adolescents’ attachment to schools is significantly and negatively related to their involvement in violent and property offending.

**Hypothesis 1c:** Adolescents’ attachment to neighborhoods is significantly and negatively related to their involvement in violent and property offending.

The main theoretical assumption is that the more individuals have attachment to significant others – including parents, school, and neighborhood – the less likely they are to engage in criminal offending behavior. For example, individuals with a strong attachment to significant others have more things to lose if they commit crime, compared with those who have a weak attachment.

**Hypothesis 2:** Adolescents’ number of delinquent peers is significantly and positively related to their violent and property offending.

An individual’s risky lifestyle and routine activities should have a direct effect on his or her criminal behavior. The assumption is that the riskier an individual’s lifestyle, the more likely he or she is to engage in offending behavior. For example, individuals with more association with delinquent peers have more opportunity to commit crime, compared
with those who have fewer delinquent peers. It is expected that more delinquent behavior would be found among adolescents who have riskier lifestyle and routine activities.

**Hypothesis 3:** Adolescents’ level of low self-control is significantly and positively related to their violent and property offending.

Gottfredson and Hirschi argue that individuals with high self-control will be “substantially less likely at all periods of life to engage in criminal acts” (1990:89), which means those with low self-control are highly likely to commit crime.

**Hypothesis 4:** Adolescent’s attachment to significant others and risky lifestyle and routine activities mediate the relationship between the adolescents’ level of self-control and their violent and property offending.

**Hypothesis 5:** Adolescents’ attachment to significant others and risky lifestyle and routine activities moderate the relationship between the adolescents’ level of self-control and their violent and property offending.

Based on integration of self-control and social bonding perspectives, there is little empirical work to confirm that the effects of self-control on crime is mediated by social bonds (Wright, Caspi, Moffitt, & Silva, 1999). Although studies have suggested that the relationship between low self-control and crime may be mediated by social bonding factors and association with deviant peers, such findings were based on a general population sample in the United States. The current dissertation tests attachment to significant others and delinquent peer associations as mediators on the relationship between the level of self-control and delinquent behavior, because the effects of low self-control on delinquency have been mediated partially by peer influences (Evans et al., 1997; Krohn et al., 1983).

**Hypothesis 6:** Country–level characteristics moderate the relationship between individual–level predictors on adolescents’ violent and property offenses.

**Hypothesis 6a:** The negative effect of attachment to significant others on violent and property crime offending is weaker in countries where there is higher level of economic dominance.
**Hypothesis 6b:** The positive effect of the level of low self-control on violent and property crime offending is stronger in countries where there is higher level of economic dominance.

**Hypothesis 6c:** The positive effect of delinquent peers on violent and property crime offending is stronger in countries where there is higher level of economic dominance.

Messner and Rosenfeld (1994) identified four key social institutions that can be developed differently by individual and collective social needs; the economy, the polity, family, and education. The theory considers how economic dominance devalues non-economic institutions, how other social institutions accommodate economic requirements, and how economic norms penetrate to other social institutions. Within a given society where the values of non-economic institutions are higher than economic institutions, serious crime rates would decrease. The current dissertation tests whether the economic dominance moderates the relationship between individual-level predictors and criminal offending.

**Conclusion**

The purpose of this dissertation is to assess the generalizability of the integrated theoretical model derived from three theories – social bonding theory, lifestyle and routine activities theory, and self-control theory – across various countries grouped separately by institutional anomie theoretical conceptualization. To accomplish this goal, the dissertation examines three broad research topics using a sample from an International Self-Reported Delinquency Study. First, the generalizability of the three theories is explored across various cultural settings within the sample. Second, before generalizability is tested, measurement invariance testing is used to determine whether the construct of youth’s low self-control, social bonding, and lifestyle/routine activities is invariant across various countries. Finally, the role of country-level contextual characteristics in explaining youth offenses is explored. Analyses examine the simultaneous effects of low self-control, social
bonding, and lifestyle/routine activities on criminal activities across different groups of countries grouped by the level of country-level contextual characteristics. These analyses enabled the study to determine whether country-level contextual factors are moderating the effects of adolescent individual characteristics on violent and property criminal offending.

The dissertation intends to address the theoretical and methodological challenges of recent cross-national criminology research, by testing measurement invariance across countries (to address methodological challenges) and integrating different theoretical concepts (to address theoretical challenges). The dissertation extends previous literature on cross-national criminology in three ways: (a) by testing measurement invariance of theoretical constructs before analyses across countries are examined to study whether measurements are invariant across countries; (b) by using the existing contemporary criminology theories’ assumptions of generalizability; and (c) by using advanced cross-cultural samples of adolescents in 24 European countries and the United States. The dissertation proposes that a comprehensively integrated theoretical framework is necessary for cross-national research in criminology.
CHAPTER IV
RESEARCH METHODS

Historically, nation states have been the focus of analysis during the 19th and 20th centuries. After World War II, the development of comparative social research coincided with the rapid formation of new states. Comparative social researchers have pointed out that the development of comparative research requires new theoretical analysis of the meanings of nation, culture, or country (Scheuch, 1989, p. 147-158). Scheuch emphasizes the importance of the name of countries as explanatory factor.

This study assumes that cultural background directly and/or indirectly influences the members of the countries studied. Villamor (1994) argues that contemporary criminological principles start from the concept of culture, which encompasses an individual's characteristics, values, goals, beliefs, and behaviors. The elements of the culture determine the way in which individuals respond and adapt to their social environments. Through socialization, individuals in a culture are influenced by the bigger socio-cultural characteristics. An important aspect of this cultural environment, this dissertation argues, is the relative dominance of the economy over other social institutions. The variation in how much individuals are influenced by cultural factors will determine and explain the variations of behavior among them (Middendorf, 1970).

The socio-cultural characteristics in each country formulate patterns of human behavior differently, depending on factors such as family interaction, social interaction, religious life, socio-economic characteristics, and ways of well-being. These factors can and
will influence behavioral patterns, including criminal and deviant behaviors. Macro-level characteristics can potentially influence an individual’s internal traits or situational factors that provide the basic elements for individual-level theories. For example, stable and consistent parental supervision patterns may be lacking in disorganized communities and underdeveloped countries (Bursik & Grasmik, 1993; Anderson, 2000).

**International Self-Report Delinquency Study (ISRD2)**

I utilized the second wave of International Self-Report Delinquency Study (ISRD2) for the current dissertation. The following discussion of the ISRD2 data is based on Chapter 2 of *The Many Faces of Delinquency* (2012) by Marshall and Enzmann, as well as the discussion provided by Junger-Tas and colleagues (2010).

The ISRD2 Steering Committee chose school classes as sampling units and suggested to include about 2,100 students in each participating country. Depending on city size, degree of urbanization, demographic, and economic variables, the sampling design required a minimum of five cities (Junger-Tas & Marshall, 2012). Following these criteria, participant researchers chose three sub-samples including a metropolitan area, a medium-sized city, and some small rural towns (Junger-Tas & Marshall, 2012). The samples were stratified by school type (academic vs. vocational) and grade level (7th, 8th, and 9th); the final sample was selected from school classes. The ISRD2 has a total of 67,883 students from 36 large sized cities, 32 medium sized cities, and 60 small towns in 31 different countries. The ISRD2 study used city-based random sampling rather than national random sampling. While the selection of the cities was made based on convenience rather than on representativeness of the country, the selected cities and towns were expected to be reasonably representative of other similarly sized areas within each country. This
sampling approach also enables researcher to better explain differences in prevalence rates of crime in the local- or macro-levels, city-based samples provide the possibility of local comparison.

From the sampling from of some 200 countries, the inclusion of the participating countries was not based on any kind of random sampling. Inviting as many participants as possible through personal contacts and networks, the ISRD-2 was conducted in 15 western European countries, and ten Eastern and Central European countries, the United States and Canada, and some outside Europe and North American countries: Aruba together with the Netherlands Antilles, Suriname, and Venezuela. Following ISRD2 sampling guidelines, 2,100 adolescents is the optimum number of respondents for each participating country. Data collection teams in each country must collect at least 700 samples from a large city or metropolitan area (about 500,000 inhabitants and more), a medium size city (between 96,000 and 144,000 inhabitants), and a cluster of small towns (10,000 to 75,000 inhabitants) (Enzmann, Marshall, Killias, Junger-Tas, Steketee, & Gruszczynska, 2010). Because of the standardization of sampling procedure across countries, comparability of individual data was across countries was significantly enhanced. Sampling decision on the selection of nations, cities and towns, schools, classrooms, and respondents are described in the 2nd chapter of the 'Many faces of delinquency' in detail (Marshall & Enzmann, 2012, see also Marshall, 2010).

The current dissertation examines two different types of delinquent offending from 59,699 adolescents in 25 countries. The study includes two Anglo-Saxon countries (USA and Ireland), four Mediterranean countries (Spain, Italy, Cyprus, and Portugal), five northern European countries (Finland, Sweden, Norway, Denmark, and Iceland), six
Western European countries (Belgium, France, Switzerland, Germany, Austria, and Netherlands), and eight post-Socialist countries in Europe (Russia, Bosnia and Herzegovina, Slovenia, Hungary, Czech Republic, Poland, Lithuania, and Estonia). Although the ISRD 2 study contains data collected from non-European countries, I use only European countries plus United States to increase comparability. For the country-level characteristics, I employed an index of economic freedom developed by the Heritage Foundation (Holmes et al., 2008) and the Gini coefficient as the measure of economic inequality are used. These two indices provide a measure of each country’s level of economic dominance at the time of the ISRD-2 survey.

**Measurement**

As an international collaborative research project, the ISRD study’s objective is to study delinquency and criminal victimization among youth, using standardized instruments and data collection procedures (Enzmann, Marshall, Killias, Junger-Tas, Steketee, & Gruszczynska, 2010). In addition to delinquent offending and victimization, the questionnaire includes adolescents’ individual social demographics, lifestyle variables, the Grasmick self-control scale, school context variables, information on neighborhood variables, and criminological theoretical variables including relationship with parents, parental supervision, bonding to school, and peer delinquency factors. The surveys were conducted in comparable classroom settings using self-administration under researchers’ supervision (Marshall, 2010).

**Dependent Variables**

The ISRD-2 data was collected from respondents’ self-surveys. While self-survey data holds several disadvantages (memory, bias, and concealment all reduce reliability), the
validity of self-survey data has been affirmed in empirical studies (include citations, such as Junger-Tas & Marshall, 1999) In addition, self-surveys have been widely used in psychological research to measure delinquent and deviant behavior to detect a wider range of behaviors in terms of variety, frequency, and seriousness (Sanches et al, 2016).

For dependent variables, I considered frequency score versus variety score versions of the same dimension. While frequency score variables measure the number of times each respondent has an experience in a certain time frame, variety score variables measure the range or number of different experiences that each respondent has had in a certain time frame. In variety score, each item in the study is assumed to represent a different type of infraction (Sanches et al, 2016).

According to Bendixen and colleagues (2003), variety score is superior to frequency score when the items have psychometric characteristics. The variety score has higher internal consistency, higher stability over time, higher group differences, and stronger associations with conceptually related variables (Sanches et al, 2016). Moreover, variety scores are less likely to be skewed than frequency score and they assign equal weight to all items. They are also more likely to have a simpler answering format for respondents (Sanches et al, 2016; Bendixen et al, 2003). Because of these advantages, a growing number of studies employ variety scores (Brown & Jennings, 2013, Donner et al, 2014; Megens & Weerman, 2011). Given the advantages of variety scores, in the current dissertation, I sum up 5 different types of offending to generate variety scores for both violent and property offending. Following Sigfusdottir, Kristjansson, and Agnew (2012) as well as Muftic, Grubb, Bouffard, and Maljevic (2014), I examine two different types of offending expecting that the
effects of adolescents’ individual factors might differ across the two different types of criminal offending.

Violent offending was measured with five different items, by asking respondents, “Did you do such a behavior in the past 12 months?” The five items measured whether they ever 1) snatched a purse, bag, or something else from a person; 2) carried a weapon, such as a stick, knife, or chain; 3) threatened somebody with a weapon or threatened to beat them up to get money or other things from them; 4) participated in a group fight on the school playground, a football stadium, the street, or in any public place; and 5) beaten up someone intentionally, or hurt anyone with a stick or knife so bad that the person had to see a doctor. Each item was measured in a dichotomous way and then summed to indicate how many different types of violent crime were committed by adolescents in the past 12 months (i.e., ranging from none to five times). Based on this combined violent offending measure, 15.87 percent of adolescents in the ISRD-2 data engaged in at least one type of violent offending. In terms of specific violent offenses, 11.44 percent of all adolescents in the study have participated in group fighting in the past 12 months, 7.24 percent have carried a weapon, 1.68 percent has beaten up someone intentionally, 1.24 percent has threatened somebody with a weapon, and 1.23 percent has snatched something from a person.

Property offending was also measured with five different items: by asking respondents, “Did you do such a behavior in the past 12 months?” The five items measuring adolescents’ property offending were whether they ever: 1) damaged something intentionally, such as a bus shelter, a window, a car or a seat in the bus or train; 2) stole something from a shop or a department store; 3) committed burglary; 4) stole a bicycle, moped, or scooter; and 5) stole a motorbike or car. Along with violent offending, each item
in property offending was measured in a dichotomous way. Thus, the combined property offending measures indicate how many different types property crime were committed by adolescents in the past 12 months (i.e., ranging from none to five times). Based on the combined property offending measures, 11.91 percent of all adolescents in the ISRD-2 data engaged in at least one type of property offending. In terms of specific property offenses, 7.50 percent of all adolescents in the study have attempted vandalism in the past 12 months, 6.23 percent have committed shoplifting, 1.90 percent reported stealing a bicycle or scooter, 0.92 percent reported committing burglary, and 0.64 percent reported stealing a motorbike or car.

**Individual-Level Independent Variables**

The current dissertation examines the central theoretical concepts from Hirschi (1969), Cohen and Felson (1979), Gottfredson and Hirschi (1990), and Messner and Rosenfeld (1994) as part of an integrated theoretical model. To accomplish this, I first needed to test and confirm the measurement invariance of the operationalized constructs representing these concepts across countries using the original ISRD-2 data. I utilize the transformed percent of maximum possible score (POMP). For individual-level variables of the ISRD-2 study, all respondents were asked to choose from 1 to 4, representing from fully agree to fully disagree. To make them more amenable to the desired characteristics of the percent of maximum possible score (POMP) (Cohen et al., 1999), individual-level predictors reflecting respondents’ attachment to significant others (parental attachment, school attachment, and neighborhood attachment) and self-control (impulsivity, risk-taking, self-centeredness, and temperament) were converted from original scores to the percent of maximum possible score. As a linear
transformation, POMP score not only permits significance tests to produce identical test statistics from untransformed scales (Posick & Rocque, 2014), but it also allows for easy comparison across indices because the scores range from 0 to 100, (Cohen et al., 1999; Posick & Rocque, 2014). Therefore, without changing the results of significance tests, the standardized presentation of the POMP scores and mean score allows for more direct comparisons (Posick & Rocque, 2015). To convert respondents’ raw scale to the POMP score, the equation given by Cohen et al., (1999, p. 323) was utilized:

\[
POMP = \left(\frac{observed - minimum}{maximum - minimum}\right) \times 100
\]

(Cohen et al., 1999; Posick & Rocque, 2014).

In the equation, observed represents the observed score for a single case, minimum represents the minimum possible score on the scale, and maximum represents the maximum possible score on the scale.

**Predictors from Social Bonding Theory**

Following empirical literature utilizing ISRD-2 data (Lu, Yu, Ren, & Marshall, 2012; Posick & Rocque, 2015; H. Zhang, Zhao, Zhao, & Ren, 2014; Ren, Zhao, He, Marshall, Zhang, Zhao, & Jin, 2015), eight manifest items are used to measure three components of social attachment: attachment to parents, attachment to school, and attachment to neighborhood. **Attachment to parents** was measured by the two items measuring closeness to mother and father. The respondents in the ISRD-2 were asked to answer two items on a 4-point Likert-type scale ranging from 1 (not at all) to 4 (very well) that asked, “How do you usually get along with the man you live with (father, stepfather)?” and “How do you usually get along with the women you live with (mother, stepmother)”? Results from principal component analysis report that these two items are correlated in the same underlying
structure with a Cronbach’s alpha level of .62. The concept of attachment to school was measured by three items on a 4-point Likert-type scale ranging from 1 (not at all true) to 4 (very true) that asked, “If I had to move I would miss my school,” “Teachers do notice when I am doing well and let me know,” and “I like my school.” Results from principal component analysis found that these three items are correlated in the same underlying structure with a Cronbach’s alpha level of .64. Attachment to neighborhood was measured by three items that asked, “If I had to move, I would miss people in neighborhood,” “My neighbors notice when I am misbehaving and let me know,” and “I like my neighborhood.” Items ranged from 1 (not at all true) to 4 (very true). Results from principal component analysis report that these three items are correlated in the same underlying structure with a Cronbach’s alpha level of .61.

Predictors from Lifestyle/Routine Activity Theory

Nine manifest items are used to measure the main component of lifestyle and routine activities theory: risky lifestyle. Theoretically, given that risky lifestyle can be measured by victim’s exposure to motivated offenders, in this research, risky lifestyle has been empirically measured by exposure to risky personal networks, getting together with friends where drugs and alcohol are available, and delinquent peers (Schreck, Stewart, & Fisher, 2006; Koo, Chitwood, & Sanchez, 2008; Turanovic & Pratt, 2012). In addition, Wikstrom (2006), in his situational action theory, suggests that individual’s acts of violence are ultimately an outcome of the interaction between their propensity and their exposure to a setting conducive to violence. Specifically, he explains that exposure is a moral context where an individual faces a temptation or provocation to engage in a violent act (Wikstrom, 2006). According to Wikstrom, individuals’ acts of violence are an outcome of the causal
interaction between their propensity to engage in crime and their exposure to situational factors to engage in acts of violence.

Thus, following these researchers, in the current dissertation I operationalized association with deviant peers in the ISRD-2 as a concept of exposure. Respondents in ISRD-2 were asked how many friend they have who have done the following delinquent acts: “used soft or hard drugs like weed, hash, XTC, speed, heroin or coke,” “Stole something from a shop or department store,” “Entered a building with the purpose to steal something,” “Threatened somebody with weapon or to beat him up, just to get money or something from him,” and “Beat someone up or hurt someone badly with something like a stick or a knife.” Results from principal component analysis found that these five items are correlated in the same underlying structure with a Cronbach’s alpha level of .70. Most of the sample did not have friends who had done such things (59.25%). However, almost 20% (19.46%) had friends who had engaged in one of these activities and close to 12% had friends that had engaged in two of these activities (11.71%). Only a small group had genuinely delinquent friends who had engaged in three or more illegal activities (9.59%).

**Predictors from Self-Control Theory**

As a modified Grasmick et al. (1993) scale, the ISRD-2 contains 12 items covering **impulsivity, risk-seeking, self-centeredness, and temperament**. Each of the 12 item ranges from 1 (strongly agree) to 4 (strongly disagree). Given that the current dissertation is focusing on individuals’ level of self-control, the summation of all 12 items represent their level of self-control. The first three items are a measure of **impulsivity**. They asked respondents how strongly they agree or disagree with the statements: “I act on the spur of the moment without stopping to think,” “I do whatever brings me pleasure here and now,
even at the cost of some distant goal,” and “I am more concerned with what happens to me in the short run than in the long run.” Results from principal component analysis reported as; these three items are correlated in the same underlying structure with a Cronbach’s alpha level of 0.57. The second three items are a measure of risk-seeking. They asked respondents how strongly they agree or disagree with the statements: “I like to test myself every now and then by doing something a little risky,” “Sometimes I will take a risk just for the fun of it,” and “Excitement and adventure are more important to me than security.” Results from principal component analysis found that these three items are correlated in the same underlying structure with a Cronbach’s alpha level of .79. The third three items are a measure of self-centeredness. They ask respondents how strongly they agree or disagree with the statements: “I try to look out for myself first, even if it means making things difficult for other people,” “If things I do upset people, it’s their problem not mine,” and “I will try to get the things I want even when I know it’s causing problems for other people,” Results from principal component analysis found that these three items are correlated in the same underlying structure with a Cronbach’s alpha level of .68. The last three items are a measure of temperament by asking respondents to rate the statements: “I lose my temper pretty easily,” “When I am really angry, other people better stay away from me,” and “When I have a serious disagreement with someone, it’s usually hard for me to talk calmly about it without getting upset.” Results from principal component analysis found that these three items are correlated in the same underlying structure with a Cronbach’s alpha level of .69.

Marshall and Enzmann (2012) indicate that the original intention of the ISRD-2 study was to use the all 12-item as a single self-control scale. As the reliability of each item above
shows, none of the individual items for self-control appeared problematic. In addition, given that the alpha for the 12-item self-control scale is better than for the four subscales (Marshall & Enzmann, 2012), I also use the 12-item self-control scale for the current dissertation.

**National-Level Predictors from Institutional Anomie Theory**

Many researchers have struggled to operationalize empirically the theoretical aspects of Institutional Anomie Theory (IAT) because of challenges in defining its theoretical concepts. According to Baumer and Gustafson (2007), a complete and comprehensive test of Institutional Anomie Theory requires “direct indicators of global cultural features” (p. 627) and “data on the extent to which the populations of the social collectives under study assimilated cultural values” (p. 628). They concluded that it is “well beyond the reach of existing sources” (Baumer & Gustafson, 2007, p. 628). Table 1 and its accompanying discussion, reviews how the Institutional Anomie Theory has been tested in the field of criminology.

<table>
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<tr>
<th>Study</th>
<th>Unit of Analysis</th>
<th>Dependent Variable</th>
<th>Institutional Variable</th>
<th>Control Variable</th>
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<tbody>
<tr>
<td>Chamlin &amp; Cochran (1995)</td>
<td>U.S. States (N=50)</td>
<td>Property crime rate measured as the total # of robbery, burglary, larceny, and auto theft offenses per 1,000 in 1980</td>
<td>Economic: Absolute economic deprivation (families below poverty level in 1979)</td>
<td>Racial heterogeneity measured as % of population that is black in 1980 and the age structure is % of population aged 18 to 24 in 1980.</td>
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<td></td>
<td>Family: Ratio of divorce/marriages per 1,000 in 1980</td>
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<td></td>
<td></td>
<td></td>
<td>Religion: Rate of church membership per 1,000 in 1980</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Polity: % of voting age individuals who voted in 1980 congressional contests.</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Sample Size/Region</td>
<td>Measures</td>
<td>Economic Indicators</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
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<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Batton &amp; Jensen (2002)</td>
<td>United States (N=1)</td>
<td>Homicide rate data from NCHS between 1900 and 1932</td>
<td>Homicide rate and mortality rates with inflation controlled for over timeDeath rates per 100,000 as a proxy for alcohol consumption, Mob murders, Immigration, Unemployment rates, Age structure of the population</td>
<td></td>
</tr>
<tr>
<td>Cullen, Parboteeah, &amp; Hoegl (2004)</td>
<td>3,450 managers across 28 nations in 2000</td>
<td>Seven items represent unethical behavior on a 1-10 scale and combining them through factor analysis</td>
<td>Cultural values: Individualism, Achievement, Universalism, and fetishism of moneyEconomy: Welfare socialismFamily: Marriage/divorce ratioEducation: Educational attainment scoreAge, gender, marital status, religious attendance</td>
<td></td>
</tr>
<tr>
<td>Kim &amp; Pridemore (2005)</td>
<td>Region in Russia for 2000 (N=78)</td>
<td>Armed robbery rates and robbery rates per 100,000</td>
<td>Economy: Composite index made from the population, poverty, unemployment, privatization, and foreign capital investment in 2000Family: Proportion of single parent families with at least one child under 18Education: Logged rate of people enrolled in college per 1,000Polity: Logged proportion of registered voters who participated in the 2000 presidential electionsEconomic inequalityAlcohol – death rates from alcohol poisoningCities over 100,000Interaction terms between socioeconomic change and the three measures for noneconomic institutions of the family, education, and polity were also included.</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Data Source</td>
<td>Measures</td>
<td>Models</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Muftic (2006)</td>
<td>U.S. born students and non U.S. born students (N=162) from Midwest university from 2004</td>
<td>thefts per 100,000 residents in 1977 Family: Composite index from time spent with close relatives over the past month Polity: Welfare assistance and voter participation Religion: Church adherence rates</td>
<td>Age and gender U.S. born and citizen of the United States were used</td>
<td></td>
</tr>
<tr>
<td>Schoepfer &amp; Piquero (2006)</td>
<td>U.S. states (N=50)</td>
<td>Embezzlement rates per 100,000 from UCR data from 1990 Questions on whether the student has cheat or not Cultural values for the American Dream Family and Education: Factored into one variable Economy: whether students was employed or not Polity: whether students was civically active</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Freichs, Munch, &amp; Monika (2008)</td>
<td>Cross – national (N=20)</td>
<td>Robbery rate per 100,000 and homicide rate per 100,000 Education: % that did not graduate from high school Polity: % of people who participated in 1990 general and local elections Family: Divorce/marriage ratio Economy: % of population unemployed Interaction terms between each noneconomic measure and the economy</td>
<td>Labor market flexibility Punitiveness GDP per capita</td>
<td></td>
</tr>
<tr>
<td>Bjerregaard &amp; Cochran (2008b)</td>
<td>Cross – national (N=49)</td>
<td>Total thefts and logged homicide rates per 100,000 for 1997 or 1996 if not available Economy: measure of economic freedom Economic inequality: Gini coefficient of household income Strength of economy: logged GDP in U.S. dollars Family: Divorce rate Polity: % of registered voters who did not participate Education: Expenditures on education as a percentage of the GDP</td>
<td>Affluence composite measures that combined measures of GDP per capita in U.S. dollars, life expectancy, and annual health expenditures.</td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Empirical Studies Testing Institutional Anomie Theory

Cullen and colleagues (2004) employed a national cultural model utilizing three of the four cultural elements in the theory: achievement, universalism, and individualism. The authors used the individual-level and aggregate-level data from the World Values Survey (WVS) from 28 different countries to represent cultural elements. To test the theory’s claim that the United States had a strong emphasis of individual success, Cao (2004) and Jensen (2002) also used the WVS data. However, using individual-level secondary data sources, such as the WVS, has been critiqued by researchers because individual-level data is highly sensitive to the specific items used to measure the core concepts of IAT (Messner & Rosenfeld, 2006; Baumer & Gustafson, 2007; Zhao & Cao, 2010). Thus, these studies utilize different items to represent the same cultural constructs, indicating on their face validity that their measures of culture have been operationalized inconsistently from the WVS.
Employing aggregate-level individual responses from the General Social Survey (GSS), Baumer and Gustafson (2007) operationalize cultural elements for the United States. The authors improve upon prior efforts by using aggregated individual-level secondary data. Although their data is representative of geographic areas and provide a means to capture cultural values of these areas, the data they used was collected during the 1970s. This fact brings into the question of whether the results could provide insights to researchers exploring current cultural or institutional causal mechanisms.

Utilizing the European Social Survey (ESS) and the data from the International Labor Organization, Gross and Haussman (2011) attempted to operationalize cultural elements at the city level in Germany and four other Eastern European countries. The authors examine individual-level responses from items measuring individuals’ value orientations – including success orientation, money fetishism, and helping others – to determine whether the value orientations were related to youths’ attitudes towards violence. However, I decided that I would not use the ESS data in the current dissertation. The main reason is that the third round of the ESS collected in 2006 (the same year as when the ISRD-2 was collected) does not include Czech Republic, Iceland, Italy, or Lithuania, all of which have participated in the ISRD-2 study. Thus, to keep these participating countries, I decided not to use the ESS in the study.

While the operationalization of anomic culture is challenging, operationalization of the economy has been established and used consistently by many empirical studies. Using the Gini coefficient and Gross Domestic Product (GDP), empirical researchers have operationalized economic dominance (Chamlin & Cochran, 1995; Bjerregaard & Cochran, 2008; Zhao & Cao, 2010; Cochran & Bjerregaard, 2011; Messner & Rosenfeld, 1997). Based
on Messner and Rosenfeld’s (1994) central theoretical tenets, I chose to consider economic
dominance in the current dissertation. For the statistical analysis, I use the index of
economic freedom developed by the Heritage Foundation (Holmes, Johnson, Kirkpatrick &
Heritage Foundation, 1997) and the Gini coefficient for determining different groups within
participating countries in the ISRD-2 study to test the strength of the economic dominance
in the relationships between individual-level predictors and criminal offending.

*Gini coefficient* Bjerregaard and Cochran (2008) used the Gini coefficient to measure
economic inequality. They find that the Gini coefficients were significantly related to
homicide rates across 49 countries. Similar to GDP per capita, the Gini coefficient for
income inequality of each participating country in the ISRD-2 study was measured by
official data collected by Eurostat and OECD. According to the OECD’s official website, the
definition of the Gini coefficient is the comparison of cumulative proportions of the
population against cumulative proportions of income they receive; it ranges between 0 in
the case of perfect equality and 1 in the case of perfect inequality. I employ each country’s
Gini coefficient as one measure of economic dominance.

*An Index of Economic Freedom* Beach and O’Driscoll defined economic freedom as “the
absence of government coercion or constraint on the production, distribution, or
consumption of goods and services beyond the extent necessary for citizens to protect and
maintain liberty itself” (2003, p.2). Developed by the Heritage Foundation, the index of
economic freedom rates each country based on fifty economic variables classified into ten
broad categories including trade policy, fiscal burden of government, government
intervention in the economy, monetary policy, capital flows and foreign investment,
banking and finance, wages and prices, property rights, regulation and black market
activity (Beach & O'Driscoll, 2005). I employ the Index of Economic Freedom as a second measure of economic dominance, because it designed to measure the absence of government constraint, which in turn can strengthen the position of economic institutions in society. The higher the score on this variable, the more economic freedom the country has.

**Grouping the Participating Countries**

Following the procedures for creating a composite index summing standardized z-scores from social institutions developed by Messner and Rosenfeld (1997), I generated standardized z-scores for the economic dominance from the index of economic freedom and Gini coefficient then took their sum. Based on the 25 and 75 percentile values of the standardized score, I grouped all participating countries into three groups as HIGH, MEDIUM, and LOW group countries, as shown below. The countries in the HIGH group have a higher level of economic dominance, while countries in the LOW group show the lower level of economic dominance. Relying on the 25 and 75 percentile of the composite index, I divided all participant countries in the study by HIGH, MEDIUM, and LOW group of countries to test the country-level moderation effect in the relationship between individual-level predictors and criminal behavior.

<table>
<thead>
<tr>
<th>Country</th>
<th>An Index of Economic Freedom</th>
<th>Gini Coefficient</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>81.98</td>
<td>0.38</td>
<td>3.425</td>
</tr>
<tr>
<td>Ireland</td>
<td>81.31</td>
<td>0.33</td>
<td>2.152</td>
</tr>
<tr>
<td>Estonia</td>
<td>78.13</td>
<td>0.33</td>
<td>1.713</td>
</tr>
<tr>
<td>Lithuania</td>
<td>72.00</td>
<td>0.35</td>
<td>1.339</td>
</tr>
<tr>
<td>Country</td>
<td>An Index of Economic Freedom</td>
<td>Gini Coefficient</td>
<td>Z-score</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
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<td>--------</td>
</tr>
<tr>
<td>Iceland</td>
<td>77.06</td>
<td>0.28</td>
<td>0.385</td>
</tr>
<tr>
<td>Germany</td>
<td>73.52</td>
<td>0.30</td>
<td>0.369</td>
</tr>
<tr>
<td>Netherlands</td>
<td>77.08</td>
<td>0.27</td>
<td>0.152</td>
</tr>
<tr>
<td>Italy</td>
<td>63.36</td>
<td>0.35</td>
<td>0.147</td>
</tr>
<tr>
<td>Finland</td>
<td>76.55</td>
<td>0.27</td>
<td>0.079</td>
</tr>
<tr>
<td>Cyprus</td>
<td>73.10</td>
<td>0.29</td>
<td>0.075</td>
</tr>
<tr>
<td>Poland</td>
<td>58.77</td>
<td>0.37</td>
<td>-0.014</td>
</tr>
<tr>
<td>Belgium</td>
<td>74.53</td>
<td>0.27</td>
<td>-0.199</td>
</tr>
<tr>
<td>Norway</td>
<td>70.09</td>
<td>0.28</td>
<td>-0.576</td>
</tr>
<tr>
<td>Austria</td>
<td>71.33</td>
<td>0.27</td>
<td>-0.641</td>
</tr>
<tr>
<td>Denmark</td>
<td>77.56</td>
<td>0.23</td>
<td>-0.725</td>
</tr>
<tr>
<td>Iceland</td>
<td>77.06</td>
<td>0.28</td>
<td>-0.782</td>
</tr>
</tbody>
</table>

Table 2. High Economic dominance Countries by summed Standardized Z-scores (N=6)

<table>
<thead>
<tr>
<th>Country</th>
<th>An Index of Economic Freedom</th>
<th>Gini Coefficient</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>79.05</td>
<td>0.28</td>
<td>0.660</td>
</tr>
<tr>
<td>Spain</td>
<td>70.87</td>
<td>0.32</td>
<td>0.475</td>
</tr>
</tbody>
</table>

Table 3. Medium Economic dominance Countries by summed Standardized Z-scores (N=11)
<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
<th>t-value</th>
<th>Z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>69.68</td>
<td>0.27</td>
<td>-0.869</td>
</tr>
<tr>
<td>Hungary</td>
<td>66.15</td>
<td>0.29</td>
<td>-0.884</td>
</tr>
<tr>
<td>France</td>
<td>66.11</td>
<td>0.28</td>
<td>-1.125</td>
</tr>
<tr>
<td>Bosnia &amp; Herz.</td>
<td>54.7</td>
<td>0.34</td>
<td>-1.284</td>
</tr>
<tr>
<td>Sweden</td>
<td>72.59</td>
<td>0.23</td>
<td>-1.411</td>
</tr>
<tr>
<td>Russia</td>
<td>54.01</td>
<td>0.31</td>
<td>-2.087</td>
</tr>
<tr>
<td>Slovenia</td>
<td>63.60</td>
<td>0.24</td>
<td>-2.416</td>
</tr>
</tbody>
</table>

Table 4. Low Economic dominance Countries by summed Standardized Z-scores (N=7)

Control Variables

Grade The ISRD-2 study asked the age of respondents in the study. However, adolescents’ grade rather than age is recommended to determine whether older students differ from younger students independent of adolescents’ socioeconomic status, school achievement, and problem behavior (Marshall & Enzmann, 2012). The proportion of respondents in each grade is relatively similar. 31.67 percent of the total number of respondents are in 7th grade (n = 14,248), 32.35 percent of them are in 8th grade (n = 14,553), and 35.98 percent of total number of samples are in 9th grade (n = 16,190).

Gender Adolescents’ gender was recoded as 1= male, and 0= female. In the data, 49.35 percent are males (n = 22,160), while 50.65 percent are females (n = 22,743).

Immigrant Status Immigrant status was measured by asking where they were born either in their country they reside or are foreign born. Their answers were recoded as 0= born in the country where they live, and 1= foreign born. 2,965 Adolescents were born in
foreign countries, while 93.38 percent (41,813) were born in their country where the data was collected.

Analytic Strategy

I utilize a variety of quantitative analytic techniques to address both the theoretical and methodological challenges that the current cross-national criminological study faces. To test my research questions and hypotheses, several different techniques are required. Before testing measurement invariance across different countries and conducting analyses to examine the relationships between the multiple individuals’ predictors and their delinquent offending, I conduct preliminary statistical procedures including univariate and bivariate analyses, factor analyses, and the treatment of missing data. If results of the preliminary analyses satisfy a certain standard, then testing measurement invariance of individuals’ psychometric factors across 24 different countries will follow. Finally, I perform binomial regression procedures onto violent and property offending after I established the measurement invariance across 24 countries. Consequently, the current dissertation takes a variety of quantitative analytic techniques categorized into three main analyses: preliminary analyses, measurement invariance testing, and binomial regression analyses.

Preliminary analyses

Exploratory Factor Analysis

I conduct factor analysis to examine patterns in the relationships between observed variables. The purpose of conducting an exploratory factor analysis is to check the structure of the covariances among observed variables (Fabrigar et al., 1999). Latent variables are unobservable common factors reflecting the covariances among the observed variables. Thus, given that a set of observed variables represent latent
variables, I examine the nature of latent constructs and determine the number of underlying latent factors for the current dissertation.

*Descriptive Statistics and Missing Values* Before multigroup confirmatory factor analysis and measurement invariance testing is conducted, I pay attention to a preliminary data scanning, including measures of central tendency, standard deviation, skewness and kurtosis, normal distribution, and missing data. Using Stata 14 for the Expectation-maximization (EM) algorithm (Booth & Schafer, 2000), I substituted values for missing cases. To deal with missing data, one of the conventional methods is listwise deletion, which excludes all missing cases from the analysis (Briggs et al, 2003). However, listwise deletion reduces a large fraction of the original sample and will result in less power to detect statistical effects (Allison, 2009). Thus, it is important to include them, if possible (Schafer & Graham, 2002). Simulation studies concluded that the EM algorithm within the Maximum Likelihood methods is a preferred method for dealing with missing data for large samples (Schafer & Graham, 2002). The EM algorithm generates values based on a dataset that includes the variables utilized in the current dissertation. All analyses were conducted both with and without missing data to check whether the results differ substantively. After conducting listwise deletion, almost 12,500 subjects were lost – from 56,669 to 44,221. I will discuss the implications of this in a later section. In addition, bivariate correlations among observed items are examined to assess the correlation pattern. The reliability of each factor of interest within each dimension of attachment, self-control, and delinquent peers is also examined.

*Analysis Overview*
Three different analyses are conducted to accomplish the goals of the current dissertation. First, the factorial structure of the measurement model is assessed by examining the baseline model of the multigroup confirmatory factor analysis on the sample of each participating countries in the ISRD-2 study respectively. Then, I test measurement invariance across countries using a multigroup confirmatory factor analysis. Finally, if I find measurement invariance across different countries, then I will test the research hypotheses of the current dissertation. The Confirmatory Factor Analysis (CFA) Model in the current dissertation hypothesized: 1) the five factor structures proposed exist within each participating country in the ISRD-2 study, and 2) the instruments in the five factors are invariant across the participating countries in the ISRD-2 study.

**Estimation**

The statistical analysis tool, Stata version 14 was used to conduct the multigroup confirmatory factor analysis models in the current dissertation. The measurement model in confirmatory factor analysis links observed variables and latent constructs. In other words, the measurement model identifies which observed variables are loading on specific latent factors. Once the measurement model is identified, the next step is to estimate model parameters. To estimate the parameter values, Maximum Likelihood (ML) is the most commonly used method in single-group studies as well as in multiple-group studies (Joreskog et al., 1996). After estimating model parameters, the model has to be tested by model fit. Multiple goodness-of-fit statistics are used to estimate the measurement model. Although the Chi-Square value is appropriate to compare two models, the Chi-Square value is sensitive with large sample size. With large sample size, minor discrepancies between
the sample and the hypothesized matrix can be found as significant. Overall, the Chi-Square test by itself is not a good estimate of model fit (Byrne, 1998; Hu & Bentler, 1999). Multiple goodness-of-fit statistics are used in the current dissertation.

**Factorial Structure Test (Single – Country Analyses)**

The factorial structure of the proposed measurement model, the baseline model of the multigroup confirmatory factor analysis model in each participating country of the ISRD-2 study is tested. The underlying assumption of the factorial structure test is that respondents’ responses on the measurement items have the same factor loading across different countries as well as that each item has similar variance when the test is conducted separately for each country.

**Multi-Group Confirmatory Factor Analysis (MGCFA)**

I employ the multiple group confirmatory factor analysis to answer the second research question on methodological challenges of comparative research: Are the theoretical instruments of interest invariant across different countries? I test the multigroup CFA using Structural Equation Modeling techniques to answer the research question with Maximum Likelihood estimation. The model and instruments are then evaluated by model fit indices using the recommended criteria indicated below.

There are two general approaches for invariance testing: the top-down approach and the bottom-up approach. I employ the bottom-up approach because this approach is relatively more reliable than other one. The bottom-up approach starts from the least constrained MGCFA model to the models with more constraints (Vandenberg & Lance, 2000). The advantage of the bottom-up approach is that I can manage the problems
presented by each step. Thus, I proceeded from a configural invariance test to a metric invariance test and finished with an intercept invariance test. Adapting from Cheung and Rensvold (2002), I provide an overview of the proposed models for invariance testing in Table 3. In terms of bottom-up approach, each test cannot be examined if the first invariance test does not hold. Here I test the hypothesis of invariance.

**Configural Invariance Test** I used a configural invariance test to examine whether the proposed five-factor model is invariant across different participating countries in the ISRD-2 study. I tested whether the countries have the same factor structure. Specifically, I examined whether the fixed and free factor loadings have the same pattern in the configural invariance model for all participating countries. Using the goodness-of-fit index criteria, I evaluated the model fit of the configural invariance. As a baseline model, this configural model is compared to the other model with more constraints.

**Metric Invariance Test** To test whether respondents in different countries understood the survey questions similarly, I conducted a metric invariance test. Metric invariance tests examine whether the strength of the relationship between factors and items are the same across different groups of interest. The factor loadings are constrained to be equal across groups to evaluate model fit of the metric invariance using goodness-of-fit index criteria. Comparing this model in relation to the previous configural model, I determined if factor loadings are equal across groups. Several scholars (Byrne et al, 1989; Steenkamp & Baumgartner, 1998) have suggested that two equal factor loadings per each construct is enough to allow a comparison of effects, which is referred to as partial metric equivalence. Also, metric invariance is sufficient to compare constructs’ unstandardized correlates with other variables of interest meaningfully across groups, such as covariances and
unstandardized regression coefficients. Metric invariance is sufficient for the regression parameters to be comparable in a meaningful way.

*Scalar Invariance Test*  
The scalar invariance test is employed to test equal indicator intercepts across groups (Meredith, 1993). If the scalar invariance is established, the means of the observed items are derived from the consequences of differences in the means of the constructs rather than from the differences in factor loadings or indicator intercepts (Steenkamp & Baumgartner, 1998). In this test, the factor loadings and factor intercepts are constrained to be equal across different groups. Thus, the findings of scalar invariance allow us to make meaningful mean comparisons of constructs. Comparing this scalar invariance model to the previous metric invariance models, I evaluate the model fit of the scalar invariance across countries. Several scholars also have suggested that two equal intercepts per construct are sufficient to compare means meaningfully (Byrne et al, 1989; Steenkamp & Baumgartner, 1998).

<table>
<thead>
<tr>
<th>Model</th>
<th>Hypothesis</th>
<th>Hypothesis Test</th>
<th>Hypothesis Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$H_{\text{form}}$</td>
<td>Overall Fit</td>
<td>Configural Invariance</td>
<td>Test of the proposed five-factor model of interest holds for all countries in the study</td>
</tr>
<tr>
<td>2</td>
<td>$H_{\wedge}$</td>
<td>2-1</td>
<td>Metric Invariance</td>
<td>The strength of the relationship between factors and items are the same across all countries</td>
</tr>
<tr>
<td>3</td>
<td>$H_{\wedge,Y}$</td>
<td>3-2</td>
<td>Scalar Invariance</td>
<td>The intercepts are invariant across different countries in the ISRD-2 study</td>
</tr>
</tbody>
</table>

Table 5. Hypotheses of Measurement Invariance Test
Binomial Regression Analysis

To examine the influence of the adolescents’ individual characteristics on their violent offending and property offending for the research hypotheses, I conduct a series of binomial regression analyses. The binomial regression analysis has to be used when the dependent variables are bounded variety scores. Given that the variety scores in this analysis are calculated from several dichotomous delinquent offending in the data, estimates below or above the certain number of counts are not interpretable (Rocque, Posick, Barkan, & Paternoster, 2014). I treat the variety score of 5 different items in 2 different types of crime offending (violent and property crime offending) as a binomial random variable. Thus, this indicates adolescents’ total number of ‘success’ out of the total 5 Bernoulli ‘trials’ in each dependent crime offending (Apel & Kaukinen, 2008). Borrowing the binomial formula, the binomial probability can be determined as:

\[ P(x) = \frac{n!}{x!(n-x)!} p^x (1 - p)^{n-x} \]

In this formula, \( x \) represents the number of successes; \( n \) represents the total number of trials; \( p \) represents the probability of adolescents’ success on each type of crime offending; \((1-p)\) represents the probability of failure (i.e. no offense). Combining all these items, the binomial formula leads to obtaining the probability of adolescents’ \( x \) number of success out of the 5 different crimes offending in each group of violent and property crime offending, \( P(x) \). In addition, adding several interaction terms between individuals’ psychometric characteristics and several different country groups divided by the Gini index and the index of economic freedom, I examine whether macro-level characteristics are
moderating the relationship between individuals’ psychometric factors and their criminal offending.

To test a mediating relationship, several empirical conditions must be met (Baron & Kenny, 1986). First, the independent variable must be observed to significantly influence the dependent variable. The second necessary condition for mediation is the relationship between the independent variable and the mediator. Finally, a relationship between mediator and dependent variable must be established. Given that the current dissertation tests whether attachment to significant others and risky lifestyle and routine activities mediate the relationship between the level of self-control and delinquent offending, if the above conditions are met, the fourth research hypothesis will be supported. In addition, to test a moderating effect of attachment and risky lifestyle on the relationship between the level of self-control and criminal offending, I generate several interaction terms in the study. Then, I will test whether attachment and risky lifestyle affect and modify the strength and direction of the association between the level of self-control and criminal offending. Finally, I will employ the z-score recommended by Paternoster et al. (1998), which tests the equality of regression coefficient across samples. Comparison of regression coefficients between HIGH and LOW groups provides a chance to test the moderating effects of country – level characteristics in the relationship between individual – level predictors and crime and delinquency.
CHAPTER V
RESULTS

The current dissertation proposes to test the comparability of psychometric instruments across participating countries of the ISRD2 study. In addition, this dissertation is designed to test several research hypotheses: 1) Adolescents' attachment to significant others is significantly related to their violent and property offending; 2) Adolescents' number of delinquent peers is significantly and positively related to their violent and property offending; 3) Adolescents' level of low self-control is significantly and positively related to their violent and property offending; 4) Adolescents' attachment to significant others and their risky lifestyles mediate the relationship between the adolescents' level of low self-control and their violent and property offending; 5) Adolescents' attachment to significant others and their risky lifestyles moderate the relationship between the adolescents' level of low self-control and their violent and property offending; 6) Country-level economic dominance moderates the relationship between individual-level predictors and their violent and property offending.

To address the methodological challenges and research hypotheses outlined in Chapter 3, four different analyses are conducted and presented: 1) the preliminary analyses, 2) the factorial structure of the theoretical constructs from social bonding theory, self-control theory, and lifestyle/routine activities theory, 3) the measurement invariance testing, and 4) the binomial regression analyses. The preliminary analyses contain the results of missing values, descriptive statistics, and exploratory factor analysis for all measurements of interest, by either individual item or by dimensions of attachment, low
self-control, and delinquent peers. In addition, the reliability of the observed indicators was examined using the Cronbach’s alpha and correlation. Second, the factorial structure of the measurement models was examined by structural equation modeling analysis. Third, the measurement invariance testing was conducted. Through this analysis, the cross-national comparability of measurements examined tests each item measures the same theoretical construct in the same way across the participating countries in the study. Finally, I tested direct, mediation, and moderation effects of individual-level predictors on crime and delinquency through binomial regression analyses.

**Preliminary Analysis**

*Exploratory Factor Analysis*

Numerous indicators were used in the study to measure the concept of attachment, low self-control, and risky lifestyles. Based on the information from previous literature, three factors for attachment to significant others were selected and rotated. The low self-control factor was selected and rotated for the level of low self-control. The delinquent peer factor was selected for risky lifestyles. The results of the final exploratory factor analysis for each construct are reported in Table 6.

<<Table 6 is here>>

*Descriptive Statistics and Missing Values*

Descriptive statistics for each variable of interest for the current dissertation are indicated in Table 7. This table contains sample size, mean, standard deviation, skewness, and kurtosis from all respondents in the current study. The statistics are computed based on a listwise deletion of data across all variables under analysis.
Listwise deletion is also called complete analysis, given that cases with valid observations on all variables of interest are the only ones analyzed. After I checked the missing values’ location, the extent, and the likelihood missing at random, I deleted missing values of each variable of interest from the dataset. The final valid sample size for analysis was reduced from 56,699 cases to 44,221. The listwise deletion sample was used in the following analyses, including MGCFA (Multiple – Group Confirmatory Factor Analyses) and binomial regression analyses. However, for testing validity of these samples, I also conducted additional binomial regression analyses by comparing two groups between the sample with missing values and the sample without missing values. In addition, in regards to skewness and kurtosis, Curran et al (1996) claim that problems occur when skewness is over 2 and kurtosis is over 7. The skewness and kurtosis of three variables of interest (Friends Burglary, Friends Extortion, and Friends Assault) were over the suggested ranges. However, after listwise deletion, those values fell well below these levels. As indicated in previous chapters, low self-control is an inability to defer gratification and lack of interest in long-term achievement and a deficit in diligence, tenacity, or persistence (Gottfredson & Hirschi, 1990). Thus, given that adolescents who have higher level of low self-control are more likely to have missing values in the data, additional analyses with missing values are necessary.

*Inter-item Correlation of Each Construct*
Attachment to Parents  The correlations among variables of attachment to parents are presented in Table 8. As expected, the correlation between the two attachment to parent variables is significant and positive.

<<Table 8 is here>>

Attachment to School  The correlation among indicators of attachment to school for all samples is presented in Table 9. These correlations are moderate, positive, and all are significant at p<.001. Among the attachment to school variables, the highest inter-item correlation was between whether respondents would miss their school if they had to move and whether they liked their school.

<<Table 9 is here>>

Attachment to Neighborhood  The correlation among indicators of attachment to neighborhood for all samples is presented in Table 10. These correlations are relatively high, positive, and all are significant at p<.001. Among the attachment to neighborhood variables, the highest inter-item correlation was both between respondents like their neighbors and it is a close-knit neighborhood.

<<Table 10 is here>>

Low Self-Control  The correlations among indicators of emotional engagement are shown in Table 11. The same as with other variables of interest in the study, the correlations among variables are high, positive, and significant at p<.001.

<<Table 11 is here>>
Delinquent Peers  The correlation among indicators of delinquent peers for all samples is presented in Table 12. These correlations are high, positive, and all are significant at p<.001. Among the variables, the highest inter-item correlation was between whether respondents had friends who used drugs and had a friend who did shop-lifting.

<<Table 12 is here>>

The Scale Reliability and Ranges

The reliability for each scale for the current dissertation was assessed by Cronbach’s alpha, which is a common measure of reliability for the internal consistency of items (Cohen, 1988). A commonly accepted general rule for interpreting internal consistency using Cronbach’s alpha is as follows: $\alpha \geq 0.9$ is excellent, $0.7 \leq \alpha \leq 0.9$ is good, $0.6 \leq \alpha \leq 0.7$ is acceptable, $0.5 \leq \alpha < 0.6$ is poor, and $\alpha < 0.5$ is unacceptable. Thus, based on the acceptable rules, each scale of interest for the current dissertation provides relatively good internal consistency as indicated below in Table 13.

<<Table 13 is here>>

In addition, I included the score range for each scale of interest for the current study presented in Table 14.

<<Table 14 is here>>

Depending on the number of items within each scale, the range varies from 0 to 5 (delinquent peers), from 2 to 8 (attachment to parents), from 4 to 16 (attachment to school, attachment to neighborhood), and from 12 to 48 (self-control).

Correlation among each Scale
Correlations were calculated among each of the scales to investigate whether there is a statistically significant association among the scales of interest in the study. Table 15 reports that the five scales of interest were all significantly correlated. The strongest correlation among scales was between respondents’ low self-control and delinquent peers, \( r(44,221) = 0.35, p<0.001 \). The significant correlations indicate that respondents who have delinquent peers are more likely to have lower level of self-control.

<<Table 15 is here>>

Single – Country Analyses

The proposed five factor model was specified and estimated repeatedly in an exploratory fashion until I obtain the best fitting model for each country of interest. Using multiple criteria for model fit, the best fitting model in each country of interest was obtained. Through the largest modification index and justification, the initial proposed five factor model was not accepted. Thus, after several re-specification and re-estimation processes, I developed the four factors model, dropping attachment to parent factor from the five factors model. Confirmatory factor analyses were conducted to test the adequacy of the four-factor structure using the data from each individual country in the ISRD-2. The four-factor model provided an adequate representation of the data in all participating countries, except for Portugal. Given this baseline model prerequisite for any subsequent measurement invariance tests, I decided to conduct my further analyses with these 24 countries without Portugal. Overall, in all 24 countries, the four-factor model provided a satisfactory model fit. Thus, I could continue to conduct the further MGCFA tests. According to the criteria introduced in the methodology chapter, the CFI, RMSEA, and SRMR of the four factors model are acceptable for all participating countries in the study. Although
there were small modifications in some countries, the results revealed that the four-dimensional model fits the ISRD-2 data across all countries.

When these error variances were allowed to covary, the best fitting model for each country was obtained. In Table 16, the best fitting models for each country are shown respectively. The chi-square to degrees of freedom ratio for almost all of countries were less than 5 with the values of the CFI, TLI were larger than 0.95. In addition, values of the Standardized Root Mean Residual (SRMR) and the Root Mean Squared Error of Approximation (RMSEA) were below 0.05 respectively. Consequently, I concluded that four factor model was the most plausible baseline model for all participating countries in the study.

<<Table 16 is here>>

**Measurement Invariance Results**

Taking a bottom-up approach, I gradually increased the number of constraints and assessed whether the model fit was not satisfied within the standard criteria when assessing configural, metric, and scalar invariance. When the model fit was not acceptable, I stopped the processes. Multiple group confirmatory factor analyses were conducted to answer the research question: are the instruments in the study invariant across different participating countries in the ISRD-2 study? According to Cheung and Rensvold (2002) and Chen (2007), the change in CFI between models should not exceed 0.01 when additional

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3 Indices of goodness of fit have been investigated in numerous studies using empirical data and simulated data. RMSEA (root mean square error of approximation): 0 indicates perfect fit and Hu & Bentler (1999) suggested <.06 as a cut-off value for a good fit. SRMR (standardized root mean squire residual): 0 indicates perfect fit and Hu & Bentler suggest a cut-off value of <.08 for a good fit. TLI (Tucker – Lewis Index): 1 indicates perfect fit. Hu & Bentler proposed > .95 as a cut-off value for a good fit. CFI (comparative fit index): Hu & Bentler suggested > .95 as a cut-off value for a good fit.
constraints are added in the next model. In addition, the change of RMSEA should not be exceeded 0.015 as well as 0.03 for SRMR in order for more constraints models to be invariant across groups. The results of the invariance tests are reported in the Table 17.

<<Table 17 is here>>

Configural Invariance

Configural invariance of the four factor models in CFA for all participating countries generally met at an acceptable level of model fit suggested for evaluation as: RMSEA and SRMR values close to .06 and .08 indicate acceptable fit, CFI values close to .95 indicate acceptable fit, and a \( \chi^2 / df \) ratio of 5:1 or less indicates a good fit. The final sample for multigroup confirmatory factor analysis in the current dissertation is 44,221 adolescents living in the 24 countries listed in Table 18. Maximum likelihood estimation was used to examine the configural invariance model as well as the other invariance models. Based on the results for the configural invariance base model (0 in Table 17), I cannot reject the configural invariance across different countries in the study. The goodness-of-fit statistics indicated a good fit for configural invariance: \( \chi^2 = 16785.35 \) (6096), \( p < .01 \), \( \chi^2 / df \) ratio = 2.75; RMSEA = 0.031; CFI = 0.963; TLI = 0.956.

Metric Invariance

The second model reports the fit indices for the metric invariance tests (1), which requires equality between the factor loadings of the indicators across the participating countries in the study. Based on the results from the 1(Table 17), the goodness-of-fit statistics indicated that the factor loadings were not invariant across the countries: \( \chi^2 = \)
21933.45 (6579), p<.01, \( \chi^2/df \) ratio = 3.33; RMSEA = 0.036; CFI = 0.946; TLI = 0.941. Given that the modification indices suggested that the constraints on the item S1 (the first item of school attachment) and N1 (the first item of neighborhood attachment) should be dropped to improve model fit and to reduce nonequivalence across the countries in the study. After I checked the poor model fit from Model 1 (CFI = 0.954; TLI: 0.948), I dropped S1 and N1 with LSC1 (the first item of low self-control) and DP3 (the third item of delinquent peers) in 2. The results from 2 (Table 17) report that partial metric invariance was established: \( \chi^2/df = 2.88; \ SRMR = 0.039; \ CFI = 0.965; \ TLI = 0.961; \ \Delta\text{CFI} = 0.002; \ \Delta\text{RMSEA} = 0.001; \ \Delta\text{SRMR} = 0.004\). These results demonstrate that the partial metric invariance model fits the data as good as the configural model. Given that the partial metric invariance is obtained in the current study, the scale interval for the latent factor is partially equal across different countries. Consequently, difference scores, such as regression coefficients or covariances, could be compared cross-nationally.

**Scalar Invariance**

Next, I tested scalar invariance model (3 in Table 17). The results from scalar invariance model were not supported. The goodness-of-fit statistics did not indicate a good fit for scalar invariance: \( \chi^2 = 52622.71 (4954), \ p<.01, \ \chi^2/df \) ratio = 10.62; RMSEA = 0.073; CFI = 0.803; TLI = 0.800. In summary, the results from the measurement invariance models were acceptable on the configural invariance and the partial metric invariance after making some modifications to indices. For the current dissertation’s purpose, to compare difference score tests cross-nationally, the partial metric invariance is
required. Consequently, based on the results from 0 to 2, regression coefficients across different countries can be compared in the next analyses.

**Binomial Regression Analyses Results**

*Descriptive Statistics*

To examine my research questions on adolescents’ crime and deviant behavior, I develop a series of regression models. Given that the dependent variable is a count of different behaviors (variety score) reflecting a lower-bound and upper-bound of violent and property crime (Apel & Kaukinen, 2008), binomial regression analyses are used.

<<Table 18 is here>>

Table 18 reports the descriptive statistics of adolescents’ socio-demographic characteristics, their average POMP score of attachment to parents, attachment to school, attachment to neighborhood, low self-control, and delinquent peers, and the variety scores of violent and property crimes including its ranges as well as standard deviations. Although attachment to parents was not identified in the multi-group confirmatory factor analyses models, I included it in the series of binomial regression analyses. Given that prior empirical studies testing the ISRD-2 data reported that attachment to parents was a significant predictor of crime and delinquency across countries (Junger-tas et al., 2012; Posick & Roque, 2014), this factor was included in the analyses to see how it could explain crime and delinquency in the study.

Descriptive statistics for respondents in the study show that 49.4 percent of samples in the study are males and 6.90 percent of respondents in the study were born in other countries rather than the country of residence. In addition, 35.42 percent of respondents
are 9th graders. On average, adolescents in the study had engaged 0.22 times in violent offending and 0.17 times in property offending. For adolescents’ individual characteristics, I used the converted POMP scores. Mean of the POMP score for attachment to parents was 88.90, attachment to school was 68.72, attachment to neighborhood was 65.55, and self-control was 38.61. The mean number of respondents’ delinquent peers in the study was 0.84. On the other hand, full sample of adolescents with missing data indicated in Table 18. It shows that 49.8 percent of full samples are males and 7.74 percent of full samples were born in other countries. Mean of the POMP score for attachment to parents was 88.95, attachment to school was 67.22, attachment to neighborhood was 60.71, and self-control was 38.93. The mean number of respondents’ delinquent peers in the study was 0.83. On average, adolescents in the study had engaged 0.24 times in violent offending and 0.17 times in property offending.

**Binomial Regression Analyses**

**Direct and Moderation Effect** The results in Table 19 identify a substantial direct effect of attachment, low self-control, and delinquent peers on violent criminal offending within the participating countries in general. The first model from Table 19 examines the relationship between individual-level factors and violent criminal offending. Male adolescents report almost 2 times more odds of being involved in violent criminal offending than female adolescents. Moreover, being born in other countries significantly increases the odds of engaging in violent offending by 21% compared to than native respondents. With regards to attachment to significant others, with every one unit increase of attachment to school there is a decrease in the odds of 5.3% \(((1 - 0.947) \times 100 = 5.3)\) for
being involved in violent criminal offending. On the other hand, with every one unit increase of attachment to neighborhood there is an increase in the odds of 1.5% for being involved in violent criminal offending. In addition, with every one unit increase of low self-control and delinquent peers there is an increase in the odds of 7.6% and 62.7% respectively. The results from the second model in Table 16 are based on the sample including the missing values. The differences of odds ratio between the first model without missing values and the second model with missing values range from 1% to 4% among individual-level predictors. These results mean that deleting missing values does not lose much information, and the potential validity issues associated with the listwise deletion of data are of less concern.

<<Table 19 is here>>

Model 3 and 4 in Table 19 introduces several interaction terms, including attachment to parent*low self-control, attachment to school*low self-control, attachment to neighborhood*low self-control, and delinquent peer*low self-control. These interaction terms identify any moderating influences of attachment to parent, attachment to school, attachment to neighborhood, and delinquent peers on violent crime offending. The interactions, between parental attachment and low self-control, school attachment and low self-control, and neighborhood attachment and self-control, produced no substantial effects on violent crime offending among population with missing values. However, the interactions between parental attachment and low self-control and attachment to school and low self-control are significant among populations without missing values, indicating that the effect of low self-control on violent criminal offending increases as parental
attachment and attachment to school increase. As detailed in my research hypothesis, the interaction term between delinquent peers and low self-control is significant and negative ($B = -.010$), indicating that the effect of low self-control on violent criminal offending decreases as delinquent peers increase.

Similar to the results for violent crime, Table 20 shows that delinquent peers increase the odds of engaging in property crime offending by 79%. In addition, low self-control increases the odds of engaging in property crime offending by 7% per one unit increase of low self-control. Among attachment factors, attachment to parents and attachment to school decrease the odds of engaging in property crime offending by nearly 10% and 5% respectively. Thus, both model 1 without missing values and model 2 with missing values establishes the substantial direct effect of attachment to parents, attachment to school, low self-control, and delinquent peers on property criminal offending within the participating countries in general. In addition, being male increased the odds of engaging in property crime offending by 68%. Moreover, whether the respondents were born in foreign countries did not have any significant effects on property criminal offending.

<<Table 20 is here>>

Models 3 and 4 in Table 20 introduce several interaction terms, including attachment to parent * low self-control, attachment to school * low self-control, attachment to neighborhood * low self-control, and delinquent peer * low self-control. These interaction terms identify any moderating influences of attachment to parent, attachment to school, attachment to neighborhood, and delinquent peer on the property criminal offending. The interactions between neighborhood attachment and self-control as well as between parental attachment and low self-control produced no substantial effects on property
criminal offending among population with missing values. However, the coefficient term between delinquent peers and self-control is significant and negative for both the listwise sample and the sample with missing values data (B = -.012 in Model, and B = -.006 in Model 4), indicating that the effect of low self-control on property criminal offending decreases as delinquent peers increases. On the other hand, for the other interaction term, model 3 based on the sample without missing value data, interaction terms were worked slightly different from model 4 based sample with missing values data. While the interactions between attachment with school and low self-control was not significant, other interactions were significant. For instance, the effect of low self-control on property criminal offending increases as parental attachment and attachment with neighborhood increases as 3% and 1%, respectively. Moreover, the effect of low self-control on property criminal offending decreases by 13% as delinquent peer increases among population without missing values.

Overall, the analyses of the direct and moderation effects of individual-level factors on violent and property crime offending, fully support research hypotheses #1, #2, and #3 proposed at the end of the Chapter 4;

**Hypothesis 1:** Adolescents’ attachment to significant others is significantly related to their violent and property offending

**Hypothesis 2:** Adolescent’s risky lifestyle and routine activities are significantly related to their violent and property offending

**Hypothesis 3:** Adolescent’s level of low self-control is significantly related to their violent and property offending

In addition, the results from binomial regression analyses confirmed Hypothesis 5: Adolescents’ attachment to significant others and their risky lifestyles moderate on the
relationship between their level of low self-control and violent and property criminal offending.

Mediation Effects In this section, several analyses are conducted to establish a relationship between respondents’ sociodemographic characteristics, their level of low self-control, and the expected mediating variables: attachment to parents, attachment to school, and attachment to neighborhood. All these variables are continuous; therefore, the relationships were studied using OLS regression: the results are reported in Table 21 below.

<<Table 21 is here>>

As indicated in Table 21, there is a significant relationship between the respondents’ level of low self-control and the expected mediating variables. The results show that as the level of low self-control decreases, so do the level of attachment to parents, school, and neighborhood. On the other hand, the level of low self-control is related to an increase in the role of delinquent peers. Based on these results, a relationship between level of low self-control and the expected mediating variables was confirmed. Overall, these results meet the second condition of Baron and Kenny’s (1986) test of mediation; the independent variables must be significantly related to the proposed mediators.

Examining the relationship between the mediating variables and the dependent variables of interest is next. In this analysis, the mediating variables were added to the analysis resulting in the first model examining the direct relationship between sociodemographic characteristics and low self-control and the dependent variables in Tables 22 and 23. This process of analyses enables us to determine whether the
relationship between individual-level predictors and violent and property criminal offending behavior can be “explained away” by the proposed mediating variables: attachment to parents, attachment to school, attachment to neighborhood, and delinquent peers.

<<Table 22 is here>>

The first and third models in Table 22 present the results for the direct relationship between respondents’ level of low self-control and violent criminal offending. The mediating variables are added in the second and fourth models to examine their mediating effects on the relationship of interest. Model 1 examines the direct relationship between low self-control and violent criminal offending while controlling for sociodemographic characteristics. The model is significant and the direct relationship shows that a one unit increase in low self-control leads to a 7% increase in the odds of engaging in violent crime. In the second model, attachment to parents, school, and neighborhood, as well as delinquent peers were added to the equation. The direct relationship between low self-control variable and violent criminal offending was not changed significantly at all, not only among population without missing values but also among population with missing values. To summarize, the relationship between adolescents’ level of low self-control and violent criminal offending remained significant throughout, after the mediators were added to the model. The results show that adolescents’ level of low self-control does not influence at all the odds of attachment to parents, school, neighborhood, and the number of delinquent peers. However, adolescents who are attached to parents and school are less likely to engage in violent criminal offending, while adolescents who are attached to neighborhood
are more likely to engage in violent offending. Also, adolescents who have delinquent peers around them are more likely to engage in violent offending. In Table 23, mediating effects of attachment to parents, school, and neighborhood and delinquent peers in the relationship between low self-control and property criminal offending are reported. Overall, results are very similar with the results found relative to violent offending. The expected mediating variables do not mediate between adolescents’ level of low self-control and property criminal offending either.

<<Table 23 is here>>

Country – Level Moderation Effect The last research hypothesis was whether the country-level economic dominance factor was consistent or variable across different countries in the study. Table 24 presents the results of binomial regression analyses models for violent crime conducted separately for countries grouped into categories of HIGH, MEDIUM, and LOW levels of economic dominance. Adolescents’ sociodemographic characteristics, attachment to significant others, their level of low self-control, and delinquent peers were entered as predictors of violent crime in the models. Notably, the effect of all individual-level predictors on violent criminal offending was significant for all the three groups of countries. Expectedly, the effect of low self-control and delinquent peers was positive and significant across the three groups of countries. Also, attachment to parents and school was negative and significant for all groups.

<<Table 24 is here>>

To test whether the strength of country-level economic dominance varied significantly across countries, I compared regression coefficients of each individual-level
predictors among three groups of countries respectively. As can be seen in Table 24, regression coefficients of respondents’ low self-control, attachment to parents, and attachment to school were significantly different across the three groups of countries based on the results from comparing regression coefficients among three groups. Low self-control was found to have stronger and positive effects on violent criminal offending for HIGH economic dominance groups than MEDIUM, and LOW groups of countries. In addition, the strength of attachment to parents varied significantly across the countries in the study. Attachment to parents were found to have stronger negative effect on violent crime for LOW economic dominance group (B = -.125) than MEDIUM (B = -.096) and HIGH (B = -.044) groups. The strength of attachment to school also varied significantly across different countries, specifically; LOW group countries (B = -.070), HIGH group countries (B = -.058), and MEDIUM group countries (B = -.033). Note however, that the strength of the effects did not vary from Low to High, as was the case for property crime.

<<Table 25 is here>>

The moderation effects of country-level economic dominance on property criminal offending are reported in Table 25. Similar to violent criminal offending, regression coefficients of delinquent peers, attachment to parents, schools, and neighborhood were significantly different across three groups of countries. While low self-control was found to have positive and significant effect on property offending, there were not significant differences among three groups of countries. As I did not expect, delinquent peers were found to have positive and stronger effects on property criminal offending among the LOW economic dominance group countries (B = .608) than MEDIUM (B = .557) and HIGH (B
= .591) group countries. Among other predictors, the effect of attachment to parents must be considered. This predictor had negative and significant effect on property criminal offending among all three groups of countries. In addition, the strength of this factor was highly significant across different groups of countries. The effect of attachment to parents on property offending is stronger within the LOW group of countries (B = -.127) than MEDIUM (B = -.122) and the HIGH (B = .085) groups of countries. Overall, although the results reported above do not perfectly support hypothesis 1 through 5, they support partially hypothesis 6: that country-level economic dominance moderates the relationship between individual-level predictors on adolescents’ violent and property criminal offending.
CHAPTER VI
DISCUSSION AND CONCLUSION

Introduction

The goal of the current dissertation was to begin addressing both theoretical and methodological challenges of cross-national criminology. In order to do this, I tested a theoretical model drawing from social bonding, self-control, and routine activity theory, and tested this on a large sample of 7th, 8th, and 9th graders from 24 countries. I attempted to link the micro- and macro-level of analysis by proposing a hypothesis drawing from IAT, suggesting a country-level moderating effect on the proposed micro-level associations. Before theory-testing began, I used multiple group confirmatory factor analysis in order to establish measurement invariance in the employed instruments across countries. In this chapter, I will first discuss the central finding, interpreting the results from multiple group confirmatory factor analyses, and binomial regression analyses as they relate to the hypotheses. In the second section, I discuss the specific substantive theoretical and methodological contributions of the current dissertation. Thereafter, I identify limitations of the current study, and I provide some recommendations for future comparative research. Finally, the current chapter concludes with a discussion of theoretical and methodological implications.

Main findings

The current dissertation applies three individual-level criminological theories (self-control theory, social bonding theory, and lifestyle/routine activities theory) as well as one
macro-level theory (institutional anomie theory) within an integrated framework to better understand adolescents’ delinquent offending across 24 countries. The results indicated high generalizability of individual-level criminological theories as well as measurement invariance across different countries. In terms of country-level moderation effect, the economic dominance factor moderated the relationship between individual-level predictors on adolescents’ violent and property offending. Overall, the finding suggests that integrating criminological theories, testing measurement invariance, and testing the generalizability across different countries are a sound research strategy for comparative criminology research.

The current dissertation shows that testing measurement invariance is an important step for comparative analysis. Examining measurement invariance of instruments is critically important before comparing means or regression coefficients across different countries, because there is no way to know whether the differences in means across countries are due to actual differences in the latent construct or due to measurement error. Taking a multi-group confirmatory factor analytic approach, the current study assessed the measurement invariance of four ISRD-2-scales that reflect various aspects from social bonding, self-control, and lifestyle and routine activities theories: attachment to school, attachment to neighborhood, low self-control, and delinquent peers.

In the current dissertation, three levels of measurement invariance were evaluated including configural, metric, and scalar invariance, to test the assumptions of measurement invariance of four-factor model across 24 countries. The findings indicated that the original 26-item version of the five-factor model did not fit the data satisfactorily because of
substantial misspecifications. Then the four factor model was modified by excluding the
two items measuring attachment to parents given that these two variables were
responsible for the misspecification. This modification produced a 24-item model that
satisfactorily fit the data from the all participating countries except Portugal. The reason
for non-invariance related to the factor loadings of attachment to parents across different
countries might come from cultural difference on the understanding of attachment to
parents.

The binomial regression analyses of individual characteristics indicated that
adolescents who had engaged in crime and delinquent offending shared similar
characteristics. For example, adolescents who had higher level of low self-control and more
delinquent peers were more likely to engage in both violent and property offending.
Furthermore, adolescents who reported to have more attachment to school were less likely
to engage in both violent and property offending. As the protective factor, adolescents who
had more attachment to parents were less likely to engage in property offending as
hypothesized. However, unexpectedly, adolescents’ attachment to neighborhood was
significantly and positively related to violent offending, which is not consistent to Hirschi’s
(1969) theoretical assumption.

On the basis of our binomial regression analyses, we tested the theoretical model that
integrates self-control theory with social bonding theory, lifestyle routine activities theory,
and institutional anomie theory. While the general theory of crime suggests that variation
in the propensity to engage in crime is mainly a function of individual differences in self-
control (Gottfredson & Hirschi, 1990), Hirschi’s (1969) social bonding theory argues
deviance is a result of weak social bonds such as poor attachment to others. It is not clear whether and how these two perspectives in control theory can be reconciled and integrated (Longshore et al., 2005), but the dissertation tries to contribute to this question by exploring if social bonds mediate the relationship between self-control and criminal offending. In addition, we also examined the notion that association with delinquent peers may be characteristic of people with low self-control and may mediate the effect of low self-control on criminal offending.

All three social bonding factors and the delinquent peer factor were strongly and significantly related with low self-control in the expected direction. These results are consistent with the theoretical propositions that people with low self-control hesitate to have close emotional ties to conventional others, spend less time in conventional activities, and associate more with delinquent peers (Gottfredson & Hirschi, 1990; Nagin & Paternoster, 1994; Wright et al., 2001). Although social bonding factors and delinquent peers were significantly related to both criminal offending, the hypothesized mediating effects between low self-control and crime were not found. These findings are consistent with previous literature that found the effect of self-control on criminal activity persisted even when potentially mediating variables were included in the models (McGloin & Shermer, 2008; Reisig, Wolfe, & Pratt, 2012).

Although the analysis did not find support for all interaction terms, the moderation effects of parental attachment and attachment to school on the relationship between low self-control and violent criminal offending were significant among the smaller sample that did not include cases with missing values. These results suggest that the effect of low self-
control on violent criminal offending increases as parental attachment and attachment to school increases. Also, as I hypothesized, the interaction term between delinquent peers and low self-control is significant and negative, indicating that the effect of low self-control on violent criminal offending decreases as delinquent peers increase. Therefore, adolescents’ relationship with delinquent peers potentially increases the effect of internalized level of low self-control on violent offending.

Institutional anomie theory represents a macro-level institutional approach to assess the social determinants of crime (Messner & Rosenfeld, 2007). Additionally, Messner and Rosenfeld (2009) offered a heuristic model of institutional anomie theory that integrates macro- and individual levels of analysis. The current dissertation emphasizes the moderating influence of country structure on individual characteristics in relation to criminal offending. The binomial regression analyses of criminal offending among three groups of country emphasized the role of economic dominance. Overall, while individual-level predictors were significantly related to criminal offending behavior among adolescents in all countries, the influence of low self-control and delinquent peers on both criminal offending was expected to be stronger in countries with higher level of economic dominance because the country-level contextual factors can act as a moderator to the relationships. That is, the impact of low self-control and delinquent peers on criminal offending among adolescents living in the United States, Ireland, Estonia, Lithuania, Switzerland, and Spain is stronger than among adolescents living in Czech Republic, Hungary, France, Bosnia & Herzegovina, Sweden, Russia, and Slovenia. Adolescents in countries with high levels of economic dominance (measured by a higher Gini coefficients and index of economic freedom) might experience strain as a result of monetary pressure.
from society. The direct effect of individual and social contextual characteristics on criminal offending in the current dissertation highlights the utility of a macro- and micro-linkage for comparative research.

The results from binomial regression analyses show that attachment to school, low self-control, and delinquent peers were significantly related to adolescents’ violent offending in general. Consistent with previous literature (see, for example Junger-Tas et al., 2012), this shows that as people have more attachment to conventional others, higher levels of self-control, and fewer delinquent peers, their probability of engaging in crime and delinquent behavior are lessened. Importantly, this appears to apply to a sample based on individuals from 24 countries. Furthermore, the results also show that the differences of odds ratio between models without missing values and models with missing values were from 1% to 4% among individual-level predictors. As such, deleting missing values does not lose much information. This is actually a very important observation, since it challenges previous research (Piquero et al., 2000; Watkins & Melde, 2007) that shows that respondents with lower self-control tend to also provide less valid and reliable data (Hindelang et al., 1981). This comes from Hirschi and Gottfredson’s argument “…self-control itself affects survey responses.” (1993:48). In other words, one would expect that the sample without missing values should produce significantly different results than the larger sample which includes all cases. While two previous studies supported Hirschi and Gottfredson’s (1993) contention that reliability and validity of self-survey research may depend on respondent’s levels of self-control, our results confirmed that there was not much difference between models without missing values and models with missing values.
Implications for Theory

Results from the current dissertation on comparative research and adolescents’ violent and property criminal offending utilized four theoretical frameworks. First, as one of the four elements of the social bonding theory, attachment is frequently used as an important construct in the field. Social bonding theory (Hirschi, 1969) postulates that some dimensions of social bonds, such as attachment to parents, attachment to school, and belief are associated with lower levels of juvenile delinquency. Research in comparative criminology has examined issues relating to social bonding theory across different countries including non-Western countries. Results from measurement invariance testing and binomial regression analyses from the current dissertation reveal the generalizability of social bonding theory across different countries. Furthermore, multiple-group confirmatory factor analysis indicated a measurement invariance of attachment to school and neighborhood across countries. In other words, social bonding theory seems to be generally applicable across a range of countries.

Second, self-control theory has been applied to comparative criminology research often, since it states that low self-control is a main determinant of crime and delinquency across different cultural settings (the so-called ‘universally applicable’ assumption). The theoretical framework of the theory postulates that weak self-control is the only cause of all types of crime and delinquency. Results from the current dissertation’s multiple-group confirmatory factor analyses revealed a measurement invariance of low self-control across different countries. In addition, results from binomial regression analyses provide the theory’s generalizability across different countries supporting Gottredson and Hirchi’s (1990) invariance thesis of self-control. However, the results provoke questions about low
self-control’s mediation and moderation effect on crime and delinquency. While adolescents’ low self-control was not mediated by their attachment to significant others, the effect of low self-control on property crime decreased moderating with delinquent peers. In other words, there is a need for further specification of the general theory of crime.

Delinquent peers are particularly important factor for adolescents because they spend most of their time in school with peers. In the field of criminology social learning theory (Akers, et al., 1979) has used this factor in explaining crime and delinquency. Based on the concept of lifestyle and exposure, we assessed lifestyle and routine activities theory by using adolescents’ delinquent peers. Social learning theory insists that adolescents observe and adopt the behaviors, attitudes, and beliefs of the people around them they respect. Although social learning theory suggests that criminal attitude and belief from others promote criminality and criminal behaviors, the current study uses this measure as an indicator of lifestyle/routine activity theory. Spending a lot of time with delinquent peers indicates a lack of adult supervision, hanging out in public places, and unstructured leisure time. Results from measurement invariance testing and binomial regression analyses supports the lifestyle and routine activities theory’s generalizability across different countries. Future studies of delinquent behavior in comparative criminology may include more measures of attitude, belief, and definition favorable to crime across different countries, consistent with the social learning perspective.

The final theoretical framework of interest for the current dissertation is institutional anomie theory. Messner and Rosenfeld (1994) focused on the interrelationships among
the various social institutions in society. By their very nature as macro-level theory, it makes us possible to observe appreciable variation in institutional structure within a larger society. Results from binomial regression analyses produced mixed and limited support for IAT. First, the effectiveness of our proposed theoretical model varied by type of criminal offending (violent and property offending). For instance, results from testing IAT for violent criminal offending were more consistent than property offending. And as hypothesized, the effect of low self-control on violent crime was stronger in countries with higher level of economic dominance. In addition, the effect of attachment to parents on violent crime was stronger in countries with lower level of economic dominance. However, we did not find any significant relationship between different measures of attachment and property offending in the three groups of countries.

Among previous work testing Institutional Anomie Theory, there are not many comparative studies examining using self-reported data (Enzmann et al., 2010). Most of them have been exclusively focused on predictors and dependent measures based on country-level official data, including crime data (Pridemore, 2011). Future comparative research should explore the possibility of obtaining individual-level self-reported data in order to understand how macro-level contextual characteristics influence individual-level predictors and behavior.

The current study examines the possibility of theoretical integration among several theoretical frameworks. Based on the results, it appears that combining ideas from several different theories provides an effective explanation of criminal offending. The results found that country-level social structural characteristics should be considered as moderating
forces. Thus, we can see that individual-level theoretical variables may have different effects on criminal offending depending on the social context where people live and interact. The current theorizing in the field has already tried multilevel theory integration, such as Agnew’s (1999) macro-level general strain theory and Aker’s (2009) social structure social learning theory. The current conceptualization of integrated theoretical framework brings us the possibility for a multilevel theory that incorporates the social institutional features along with individual-level internal and external factors.

Implications for Research Methodology

In addition to implications for theory, several implications for research methodology are derived from the findings of the current dissertation. These following implications will be discussed; the operationalization of institutional anomie theoretical concepts, the excessive emphasis on countries based on Western cultural settings, the measurement issue of delinquent peers to measure individual’s risky lifestyle, and the need for longitudinal data and design.

Although this work provided a comprehensive test of a macro- and micro- linked conceptual model across different countries, we need to discuss the issue of operationalization. In the past, among researchers who tested institutional anomie theory (Chamlin & Cochran, 2007; Messner & Rosenfeld, 2009), operationalization of key theoretical concepts was a common challenge, which the current research also faced and did not resolve satisfactory. The economic dominance in this dissertation represents the latent construct of an “institutional imbalance of power” among the economy, polity, education, and familiar institutions (Messner & Rosenfeld, 2009). However, the current research was not able to measure each institution as the theory suggests. Thus, the
mechanism by which economic institutions penetrate into other social institutions was not analyzed. Future research could focus on the development of a standard guidance to measure the economic and noneconomic social institutions based on institutional anomie theoretical framework.

In addition, the composition of the participating countries in the current dissertation needs to be discussed. All participating countries in the study were from Western cultural settings, including most of the European countries plus the United States. That provides for a rather limited test of the generalizability of our model. Furthermore, our study which uses Gini coefficients and an index of economic freedom as a proxy for economic dominance created three groups of countries which may not be very comparable. The findings of this dissertation report that country–level social contextual characteristics, for instance, economic dominance, moderate in the relationship between individual–level characteristics on delinquent offending. However, it may very well be plausible that–if we had used other economic scale or items to group the countries–we would have produced three different groups of countries. Therefore, future comparative research should focus on the consideration of the diversity of participating countries reflecting diverse cultural characteristics, as well as developing more robust indicators of economic dominance.

There are also methodological limitations related to measurement invariance testing in this research. Initially, Portugal was included in the ISRD2 study as well as in the current dissertation. Given that measurement data from Portugal suggested a need to remove Portugal, adolescents living in Portugal have been deleted. Moreover, a five factors model was proposed to test using multiple group confirmatory factor analysis, but because
attachment to parents has not been identified across different countries in the first step of tests, this measure also has been deleted. However, this factor has been included in the binomial regression analyses, because it is critical factor to test Hirschi’s (1969) social bonding theory.

Another limitation is related to our choice to use deviant peers as a measure of routine activities theory (rather than social learning theory). Theoretically and empirically, risky lifestyle has been measured by risky personal networks, including victim’s exposure to motivated offenders as well as association with drug users or peers (Koo, Chitwood, & Sanchez, 2008). The findings are useful to show how comparative criminologists examine adolescents’ risky lifestyle and exposure based on their delinquent peers. However, the delinquent peer factor is the key concept for differential association theory/social learning theory rather than lifestyle/routine activities theory. We wanted to follow Karstedt’s (2001) contention that all three components of RAT’s causal mechanism are determined by cultural values and practices, which makes RAT a very suitable theory for comparative research. Future comparative research needs to find different and more commonly used measures of RAT.

The current dissertation has shown that direct, mediation, and moderation effects of several of the measures of individual – level theoretical concepts are important in explaining adolescents’ criminal offending. Although interrelationship among these concepts were identified, consideration that an individual’s previous internal characteristics and experience might have an effect on current characteristics and behavior is crucial in understanding of criminal behavior throughout one’s life. Furthermore,
understanding the influence of past individual’s internal characteristics on current characteristics and behaviors are crucially important to develop intervention programs that aim to reduce crime and delinquent behaviors. The current study has made it clear that it is important to include analysis of mediating and moderating effects in comparative research.

**Limitations**

There are several important limitations to discuss that pertain to the dissertation’s theoretical and methodological contributions. In my initial argument, I suggested that critical issues arise when criminologists utilize criminological theories derived from Western cultural settings when trying to understand delinquent in non-Western settings. However, in the dissertation, I employ data collected in Europe and the USA, and I do not use data from non-Western countries. Fortunately, the cultural variety among the 24 Western countries is also quite significant, and provides a unique opportunity to test the generalizability of the conceptual model. The ISRD2 data includes a few non-Western countries, but they lack suitable macro-level indicators needed to test my theoretical model. Future research should expand the testing social bonding theory, self-control theory, routine activities theory, and institutional anomie theory on a sample including also non-Western countries.

Another limitation is that individual-level predictors and criminal offending in the ISRD2 are based on self-reported cross-sectional surveys completed by adolescents. There is a large body of writing on the validity and reliability issues related to self-report surveys (e.g. Junger-Tas & Marshall, 1999). Adolescents in the study might have been hesitant to report their criminal offending or the number of delinquent peers in order to provide
socially desirable answers. In addition, since missing values can bias a sample (Davey, 2005), it is possible that the results also are biased. In order to control for that possibility, binomial regression analyses both with missing values and without missing values were conducted, showing some mixed results. In particular, it is possible that adolescents who did not complete all survey questions might have lower level of self-control. Although missing values were put into dataset after EM algorithm, there was no way to test the relationship between the level of low self-control and missingness.

Since this study uses a cross-sectional survey, we are limited in understanding the causal relationship among individual-level predictors. We know that individual characteristics and attitudes are formed over time (Schreck et al., 2004, 2008) and that is not something that may be captured by the cross-sectional design. Thus, the current dissertation is not able to establish temporal effects of self-control, social bonding, and having association with delinquent peers on offending.

A final limitation is the operationalization of institutional anomie theory’s key concepts in the study. In the current study, IAT was tested with a rather narrow measure (economic dominance), without including indicators of the relative importance of other social institutions, such as education, family, or polity. Whether non-economic institutions moderate or mediate the effect of the economy on crime or the effect of individual-level predictors on crime should be taken into consideration in future studies, if the data is available. Furthermore, our measure of economic dominance (a combination of the gini index of income inequality and the Heritage Foundations’ index of economic freedom) may also not be a valid measure to capture economic dominance. For example, according to
Piquero and Piquero (1998), the effect of the economy on cross-national rates of crime is very sensitive to how the economy is measured. They found that institutional anomie theory was consistently supported when the economy was operationalized as a measure of the level of economic deprivation, rather than by annual levels of social security spending.

**Conclusion**

The primary goal of the current dissertation was to test four contemporary criminological theories – Self-Control theory, Social Bonding theory, Lifestyle/Routine Activities theory, and Institutional Anomie theory – on a large cross-national sample of 12-16 year old. A secondary goal of this dissertation was to test whether or not measurement of theoretical concepts are comparable across a variety of countries. To achieve both goals, multiple group confirmatory factor analyses were used to test measurement invariance across different countries and binomial regression analyses were used to test the proposed conceptual model utilizing the ISRD-2 study.

The conceptual model identified macro-level economic characteristics as a moderator in the relationship between micro-level characteristics and criminal offending, as well as the interrelationship among micro-level theories through the inclusion of several interactions between low self-control, attachment to significant others, and delinquent peers, and the comparability of measurement across different countries. After results from the metric invariance testing revealed that regression coefficients could be compared across countries, six research hypotheses derived from the four theories were tested.

The main results the current dissertation are the following;
1) Measurement invariance testing is important and should be a prerequisite for accurate comparison among countries in comparative research;

2) Including a macro–to micro– linkage in a single conceptual model is a useful way to increase our understanding of criminal behavior in a comparative framework;

3) Theories developed primary in the USA appear to be generalizable across a variety of cultural contexts; and

4) Theoretical integration through the use of constructs from different theories is a useful method to identify direct, mediation, and moderation effects.

To summarize: The results of the current study contribute to our understanding of the linkage between macro- and micro- level factors, the importance of measurement invariance testing, and the potential of theory integration for future comparative criminology research. However, some theoretical and methodological challenges within current comparative research remain still unanswered by the current dissertation. Thus, future research should expand the geographical range of included countries, and – if feasible – collect longitudinal data. Future comparative crime research should also focus on the direct effect of macro-level social contextual factors on criminal behavior using multilevel modeling. Research examining the relationship between country – level factors and individual – level criminal behavior is at the heart of cross-national research, not only because it provides important theoretical insights but also because it will aid in the better understanding of how national level policies may impact the nature and extent of adolescent offending. The findings reported in this dissertation hopefully will provide momentum for further theoretical integration across micro- and macro-level theories and
making measurement invariance testing a common practice among comparative crime researchers.
REFERENCES


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doi:10.1016/j.jcrimjus.2015.02.001


Research in Crime and Delinquency, 51(6), 703-734.

doi:10.1177/0022427814538034


Table 6: Results of Exploratory Factor Analysis

<table>
<thead>
<tr>
<th>Indicators</th>
<th>AP</th>
<th>AS</th>
<th>AN</th>
<th>LSC</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting along with Father</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting along with Mother</td>
<td>0.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would miss school</td>
<td></td>
<td>0.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Considerate Teachers</td>
<td></td>
<td></td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like my school</td>
<td></td>
<td></td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other activities</td>
<td></td>
<td></td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like my neighborhood</td>
<td></td>
<td></td>
<td></td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>Helpful neighbors</td>
<td></td>
<td></td>
<td></td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Close-kit neighborhood</td>
<td></td>
<td></td>
<td></td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>Trustable neighbors</td>
<td></td>
<td></td>
<td></td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>Act on spur of moment</td>
<td></td>
<td></td>
<td></td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>Act for short pleasure</td>
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<td></td>
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<td>0.47</td>
<td></td>
</tr>
<tr>
<td>More concerned short run</td>
<td></td>
<td></td>
<td></td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td>Do risky things</td>
<td></td>
<td></td>
<td></td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>Risk just for fun</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Excitement important</td>
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<td></td>
<td></td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>Look out for myself first</td>
<td></td>
<td></td>
<td></td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Don’t mind upsetting others</td>
<td></td>
<td></td>
<td></td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Don’t mind causing problems</td>
<td></td>
<td></td>
<td></td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Lost temper easily</td>
<td></td>
<td></td>
<td></td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>People stay away if angry</td>
<td></td>
<td></td>
<td></td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Hard to discuss calmly</td>
<td></td>
<td></td>
<td></td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Friends using drugs</td>
<td></td>
<td></td>
<td></td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Friends shop-lifting</td>
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<td></td>
<td></td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Friends burglary</td>
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<td></td>
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<td>0.53</td>
<td></td>
</tr>
<tr>
<td>Friends extortion</td>
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<td></td>
<td></td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Friends assault</td>
<td></td>
<td></td>
<td></td>
<td>0.58</td>
<td></td>
</tr>
</tbody>
</table>

(Note. Ap=Attachment to Parent; AS=Attachment to School; AN=Attachment to Neighborhood; LSC=Low Self-Control; DP=Delinquent Peers)
Table 7: Descriptive Statistics for Variables of Interest - All Samples after lifewise deletion

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting along with Father</td>
<td>44,221</td>
<td>3.620</td>
<td>0.644</td>
<td>-1.772</td>
<td>6.003</td>
</tr>
<tr>
<td>Getting along with Mother</td>
<td>44,221</td>
<td>3.713</td>
<td>0.561</td>
<td>-2.095</td>
<td>7.578</td>
</tr>
<tr>
<td>Would miss school</td>
<td>44,221</td>
<td>3.151</td>
<td>1.005</td>
<td>-0.959</td>
<td>2.753</td>
</tr>
<tr>
<td>Considerate Teacher</td>
<td>44,221</td>
<td>3.033</td>
<td>0.916</td>
<td>-0.689</td>
<td>2.643</td>
</tr>
<tr>
<td>Like my school</td>
<td>44,221</td>
<td>2.892</td>
<td>0.966</td>
<td>-0.556</td>
<td>2.359</td>
</tr>
<tr>
<td>Other activities</td>
<td>44,221</td>
<td>3.168</td>
<td>1.020</td>
<td>-0.947</td>
<td>2.635</td>
</tr>
<tr>
<td>Like my neighborhood</td>
<td>44,221</td>
<td>3.303</td>
<td>0.912</td>
<td>-1.187</td>
<td>3.447</td>
</tr>
<tr>
<td>Helpful neighborhood</td>
<td>44,221</td>
<td>2.998</td>
<td>0.950</td>
<td>-0.636</td>
<td>2.448</td>
</tr>
<tr>
<td>Close-knit neighborhood</td>
<td>44,221</td>
<td>2.741</td>
<td>0.998</td>
<td>-0.275</td>
<td>2.001</td>
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<tr>
<td>Act on spur moment</td>
<td>44,221</td>
<td>2.393</td>
<td>0.976</td>
<td>0.042</td>
<td>1.981</td>
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<td>Act for short pleasure</td>
<td>44,221</td>
<td>2.066</td>
<td>0.989</td>
<td>0.495</td>
<td>2.136</td>
</tr>
<tr>
<td>More concerned short run</td>
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<td>2.378</td>
<td>1.033</td>
<td>0.101</td>
<td>1.843</td>
</tr>
<tr>
<td>Do risk things</td>
<td>44,221</td>
<td>2.320</td>
<td>1.076</td>
<td>0.155</td>
<td>1.733</td>
</tr>
<tr>
<td>Risk just for fun</td>
<td>44,221</td>
<td>2.177</td>
<td>1.065</td>
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<td>1.827</td>
</tr>
<tr>
<td>Excitement important</td>
<td>44,221</td>
<td>2.006</td>
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<td>0.604</td>
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<tr>
<td>Look out for myself first</td>
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<tr>
<td>Don’t mind upsetting others</td>
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<td>1.977</td>
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</tr>
<tr>
<td>Don’t mind causing problems</td>
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<td>3.397</td>
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<td>Lost temper easily</td>
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<tr>
<td>People stay away if angry</td>
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</tr>
<tr>
<td>Hard to discuss calmly</td>
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<td>2.415</td>
<td>1.073</td>
<td>0.090</td>
<td>1.750</td>
</tr>
<tr>
<td>Friends using drugs</td>
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<td>0.260</td>
<td>0.439</td>
<td>1.089</td>
<td>2.187</td>
</tr>
<tr>
<td>Friends shop-lifting</td>
<td>43,481</td>
<td>0.345</td>
<td>0.475</td>
<td>0.650</td>
<td>1.423</td>
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<tr>
<td>Friends burglary</td>
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<td>0.085</td>
<td>0.279</td>
<td>2.960</td>
<td>9.766</td>
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<tr>
<td>Friends extortion</td>
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<td>0.239</td>
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<tr>
<td>Friends assault</td>
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<td>0.289</td>
<td>2.817</td>
<td>8.940</td>
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</table>
Table 8: Inter-Item Correlation between Attachment to Parents Variables (N= 44,221)

<table>
<thead>
<tr>
<th></th>
<th>P1: Getting along w/Father</th>
<th>P2: Getting along w/Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P1: Getting along w/Father</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>P2: Getting along w/Mother</strong></td>
<td>0.45***</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 9: Inter-item Correlation between Attachment to School Variables (N= 44,221)

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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</thead>
<tbody>
<tr>
<td><strong>S1: Miss School</strong></td>
<td>1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>S2: Considerate Teacher</strong></td>
<td>0.25***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>S3: Like School</strong></td>
<td>0.55***</td>
<td>0.30***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>S4: Other Activities</strong></td>
<td>0.19***</td>
<td>0.22***</td>
<td>0.23***</td>
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</table>

Table 10: Inter-item Correlation b/w Attachment to Neighborhood Variables (N= 44,221)

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N1: Like Neighborhood</strong></td>
<td>1</td>
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</tr>
<tr>
<td><strong>N2: Watchful Neighborhoods</strong></td>
<td>0.23***</td>
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</tr>
<tr>
<td><strong>N3: Close-knit Neigh</strong></td>
<td>0.61***</td>
<td>0.19***</td>
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</table>
Table 11: Inter-item Correlation b/w Low Self-Control Variables (N= 44,221)

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<th>SC1</th>
<th>SC2</th>
<th>SC3</th>
<th>SC4</th>
<th>SC5</th>
<th>SC6</th>
<th>SC7</th>
<th>SC8</th>
<th>SC9</th>
<th>SC10</th>
<th>SC11</th>
<th>SC12</th>
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<tbody>
<tr>
<td></td>
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<td>0.43***</td>
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<td>0.20***</td>
<td>0.27***</td>
<td>0.32***</td>
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<td>0.24***</td>
<td>0.22***</td>
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<td></td>
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<td>0.29***</td>
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<td>0.29***</td>
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<td>0.38***</td>
<td>0.29***</td>
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<td>0.32***</td>
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<td>0.49***</td>
<td></td>
<td>0.56***</td>
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<td></td>
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<td>0.29***</td>
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<td>0.30***</td>
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<td></td>
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<td></td>
<td>0.19***</td>
<td></td>
<td>0.21***</td>
<td></td>
<td>0.23***</td>
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<td>0.21***</td>
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<td>0.23***</td>
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<td>0.25***</td>
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<td>0.24***</td>
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<td>0.21***</td>
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<td>0.23***</td>
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<td>0.23***</td>
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<td></td>
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<td>0.27***</td>
<td></td>
<td>0.23***</td>
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<td>0.45***</td>
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<td>0.42***</td>
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</table>
Table 12: Inter-item Correlation between Delinquent Peers Variables, (N= 44,221)

<table>
<thead>
<tr>
<th></th>
<th>DP1</th>
<th>DP2</th>
<th>DP3</th>
<th>DP4</th>
<th>DP5</th>
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<tbody>
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<td></td>
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</tr>
<tr>
<td>DP2</td>
<td>0.41***</td>
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<td></td>
</tr>
<tr>
<td>DP3</td>
<td>0.29***</td>
<td>0.35***</td>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>DP4</td>
<td>0.28***</td>
<td>0.26***</td>
<td>0.34***</td>
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</tr>
<tr>
<td>DP5</td>
<td>0.31***</td>
<td>0.28***</td>
<td>0.30***</td>
<td>0.46***</td>
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</table>

Table 13: Reliability for Total Scales from All Samples Note, W/O = Without; W/ = With

<table>
<thead>
<tr>
<th>Scales</th>
<th>Cronbach’s Alpha</th>
<th>Number of Items</th>
<th>Number of Cases (W/O Missing Values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to Parents</td>
<td>0.61</td>
<td>2</td>
<td>44,221</td>
</tr>
<tr>
<td>Attachment to School</td>
<td>0.62</td>
<td>4</td>
<td>44,221</td>
</tr>
<tr>
<td>Attachment to Neighborhood</td>
<td>0.80</td>
<td>4</td>
<td>44,221</td>
</tr>
<tr>
<td>Low Self – Control</td>
<td>0.83</td>
<td>12</td>
<td>44,221</td>
</tr>
<tr>
<td>Delinquent Peers</td>
<td>0.68</td>
<td>5</td>
<td>43,025</td>
</tr>
</tbody>
</table>
Table 14: The Score Range for Each Scale of Interest

<table>
<thead>
<tr>
<th>Scales</th>
<th>Range</th>
<th>Mean of Scale</th>
<th>Standard Deviation of Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to Parents</td>
<td>2-8</td>
<td>7.33</td>
<td>1.02</td>
</tr>
<tr>
<td>Attachment to School</td>
<td>4-16</td>
<td>12.24</td>
<td>2.67</td>
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<tr>
<td>Attachment to Neighborhood</td>
<td>4-16</td>
<td>11.86</td>
<td>3.03</td>
</tr>
<tr>
<td>Low Self – Control</td>
<td>12-48</td>
<td>25.89</td>
<td>7.24</td>
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<tr>
<td>Delinquent Peers</td>
<td>0-5</td>
<td>0.84</td>
<td>1.18</td>
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</table>

Table 15: Correlation among Scales

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<thead>
<tr>
<th>Scales</th>
<th>AP</th>
<th>AS</th>
<th>AN</th>
<th>LSC</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to Parents</td>
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</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Attachment to Neighborhood</td>
<td>0.18***</td>
<td>0.26***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Self – Control</td>
<td>-0.19***</td>
<td>-0.16***</td>
<td>-0.10***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Delinquent Peers</td>
<td>-0.19***</td>
<td>-0.18***</td>
<td>-0.12***</td>
<td>0.35***</td>
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</table>
Table 16: Single-country analyses: Modifications and global model fit of the Four Factor Model for all countries

<table>
<thead>
<tr>
<th>Country</th>
<th>$X^2$</th>
<th>df</th>
<th>$X/df$</th>
<th>SRMR</th>
<th>CFI</th>
<th>RMSEA</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>810.14</td>
<td>254</td>
<td>3.18</td>
<td>0.039</td>
<td>0.963</td>
<td>0.036</td>
<td>0.956</td>
</tr>
<tr>
<td>Austria</td>
<td>743.26</td>
<td>254</td>
<td>2.92</td>
<td>0.028</td>
<td>0.970</td>
<td>0.028</td>
<td>0.965</td>
</tr>
<tr>
<td>Belgium</td>
<td>695.58</td>
<td>254</td>
<td>2.73</td>
<td>0.036</td>
<td>0.958</td>
<td>0.033</td>
<td>0.950</td>
</tr>
<tr>
<td>Bosnia&amp;Herzegovina</td>
<td>545.18</td>
<td>254</td>
<td>2.14</td>
<td>0.032</td>
<td>0.967</td>
<td>0.029</td>
<td>0.961</td>
</tr>
<tr>
<td>Cyprus</td>
<td>584.77</td>
<td>254</td>
<td>2.30</td>
<td>0.031</td>
<td>0.973</td>
<td>0.028</td>
<td>0.968</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>798.02</td>
<td>254</td>
<td>3.14</td>
<td>0.033</td>
<td>0.960</td>
<td>0.029</td>
<td>0.953</td>
</tr>
<tr>
<td>Denmark</td>
<td>533.82</td>
<td>254</td>
<td>2.10</td>
<td>0.036</td>
<td>0.961</td>
<td>0.033</td>
<td>0.954</td>
</tr>
<tr>
<td>Estonia</td>
<td>682.34</td>
<td>253</td>
<td>2.69</td>
<td>0.036</td>
<td>0.955</td>
<td>0.032</td>
<td>0.947</td>
</tr>
<tr>
<td>Finland</td>
<td>622.43</td>
<td>254</td>
<td>2.45</td>
<td>0.037</td>
<td>0.958</td>
<td>0.034</td>
<td>0.951</td>
</tr>
<tr>
<td>France</td>
<td>804.80</td>
<td>253</td>
<td>3.18</td>
<td>0.032</td>
<td>0.960</td>
<td>0.032</td>
<td>0.953</td>
</tr>
<tr>
<td>Germany</td>
<td>909.61</td>
<td>253</td>
<td>3.59</td>
<td>0.033</td>
<td>0.964</td>
<td>0.031</td>
<td>0.957</td>
</tr>
<tr>
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<td>662.03</td>
<td>254</td>
<td>2.60</td>
<td>0.035</td>
<td>0.962</td>
<td>0.031</td>
<td>0.955</td>
</tr>
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<td>Iceland</td>
<td>449.77</td>
<td>253</td>
<td>1.77</td>
<td>0.053</td>
<td>0.948</td>
<td>0.042</td>
<td>0.938</td>
</tr>
<tr>
<td>Ireland</td>
<td>548.56</td>
<td>252</td>
<td>2.17</td>
<td>0.035</td>
<td>0.962</td>
<td>0.032</td>
<td>0.954</td>
</tr>
<tr>
<td>Italy</td>
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<td>253</td>
<td>4.60</td>
<td>0.028</td>
<td>0.965</td>
<td>0.029</td>
<td>0.959</td>
</tr>
<tr>
<td>Lithuania</td>
<td>585.56</td>
<td>255</td>
<td>2.29</td>
<td>0.030</td>
<td>0.957</td>
<td>0.029</td>
<td>0.950</td>
</tr>
<tr>
<td>Netherlands</td>
<td>646.51</td>
<td>252</td>
<td>2.56</td>
<td>0.032</td>
<td>0.965</td>
<td>0.030</td>
<td>0.958</td>
</tr>
<tr>
<td>Norway</td>
<td>581.58</td>
<td>255</td>
<td>2.28</td>
<td>0.038</td>
<td>0.970</td>
<td>0.032</td>
<td>0.964</td>
</tr>
<tr>
<td>Poland</td>
<td>577.52</td>
<td>254</td>
<td>2.27</td>
<td>0.035</td>
<td>0.959</td>
<td>0.033</td>
<td>0.952</td>
</tr>
<tr>
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<td>696.49</td>
<td>254</td>
<td>2.74</td>
<td>0.035</td>
<td>0.962</td>
<td>0.032</td>
<td>0.955</td>
</tr>
<tr>
<td>Slovenia</td>
<td>616.43</td>
<td>255</td>
<td>2.41</td>
<td>0.034</td>
<td>0.968</td>
<td>0.028</td>
<td>0.963</td>
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<td>538.91</td>
<td>255</td>
<td>2.11</td>
<td>0.035</td>
<td>0.965</td>
<td>0.029</td>
<td>0.959</td>
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<tr>
<td>Sweden</td>
<td>603.15</td>
<td>253</td>
<td>2.38</td>
<td>0.031</td>
<td>0.973</td>
<td>0.029</td>
<td>0.968</td>
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<tr>
<td>Switzerland</td>
<td>1054.2</td>
<td>253</td>
<td>4.16</td>
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<td>0.962</td>
<td>0.032</td>
<td>0.955</td>
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</table>
Table 17: Measurement Invariance of the Four Factor Model in MGCFA (24 Countries (Portugal is deleted), N= 44,221)

Table 17, part 1

<table>
<thead>
<tr>
<th>Model</th>
<th>Specifications</th>
<th>$X^2$</th>
<th>$Df$</th>
<th>CFI</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>Configural Invariance</td>
<td>16785.35</td>
<td>6096</td>
<td>0.963</td>
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<tr>
<td>1</td>
<td>Full Metric Invariance</td>
<td>21933.45</td>
<td>6579</td>
<td>0.946</td>
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<tr>
<td>2</td>
<td>Partial Metric Invariance *</td>
<td>12906.24</td>
<td>4471</td>
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<tr>
<td>3</td>
<td>Scalar Invariance</td>
<td>52622.71</td>
<td>4965</td>
<td>0.803</td>
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</table>

Table 17, part 2

<table>
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<tr>
<th>Model</th>
<th>Specifications</th>
<th>RMSEA</th>
<th>TLI</th>
<th>ΔCFI</th>
<th>ΔRMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Configural Invariance</td>
<td>0.031</td>
<td>0.956</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Full Metric Invariance</td>
<td>0.036</td>
<td>0.941</td>
<td>0.017</td>
<td>0.005</td>
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<tr>
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<td>Partial Metric Invariance *</td>
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<td>0.961</td>
<td>0.002</td>
<td>0.001</td>
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<td>Scalar Invariance</td>
<td>0.073</td>
<td>0.800</td>
<td>0.160</td>
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</table>

Note: Data is taken from the ISRD-2 data. *The constraints of items S1, N1, SC1, and DP3 were released.
Table 18: Sample Descriptive Statistics after listwise deletion (24 countries; N=44,221)

<table>
<thead>
<tr>
<th>Continuous Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Min – Max</th>
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<tbody>
<tr>
<td>Attachment to Parents</td>
<td>88.901</td>
<td>17.110</td>
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<tr>
<td>Attachment to School</td>
<td>68.723</td>
<td>22.303</td>
<td>0 - 100</td>
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<tr>
<td>Attachment to Neighborhood</td>
<td>65.555</td>
<td>25.321</td>
<td>0 – 100</td>
</tr>
<tr>
<td>Low Self – Control</td>
<td>38.606</td>
<td>20.138</td>
<td>0 – 100</td>
</tr>
<tr>
<td>Delinquent Peers</td>
<td>0.843</td>
<td>1.184</td>
<td>0 – 5</td>
</tr>
<tr>
<td>Violent Crime</td>
<td>0.219</td>
<td>0.592</td>
<td>0 – 5</td>
</tr>
<tr>
<td>Property Crime</td>
<td>0.170</td>
<td>0.526</td>
<td>0 – 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Dichotomous Variables</th>
<th>Freq.</th>
<th>Percent</th>
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</thead>
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<tr>
<td>Sex</td>
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<td>Female</td>
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<td>Grade 7</td>
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<td>Grade 8</td>
<td>14,485</td>
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<td>Grade 9</td>
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Table 18-1: Sample Descriptive Statistics before listwise deletion (24 countries; 56,699 respondents)

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<tr>
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<td>0 – 100</td>
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<td>0.238</td>
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<td>Property Crime</td>
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<td>28,171</td>
<td>49.80</td>
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<td>Female</td>
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<td>28,399</td>
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<td>18,630</td>
<td>32.86</td>
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Table 19: Direct and Moderation Effects of Individual – Level Factors on Violent Crime (24 countries; 43,939 respondents without missing values and 56,337 with missing values)

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<th>2 W</th>
<th>3 W/O</th>
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<th>4 W</th>
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<td>Missing values</td>
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<td>Sig.</td>
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<td>B</td>
<td>Sig.</td>
<td>EXP (B)</td>
<td>B</td>
<td>Sig.</td>
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<td>.000</td>
<td>2.762</td>
<td>.950</td>
<td>.000</td>
<td>2.586</td>
<td>1.008</td>
<td>.000</td>
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<td>.027</td>
<td>1.066</td>
<td>.053</td>
<td>.031</td>
<td>1.054</td>
<td>.083</td>
<td>.004</td>
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<tr>
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<td>.204</td>
<td>1.034</td>
<td>.030</td>
<td>.180</td>
<td>1.031</td>
<td>.045</td>
<td>.083</td>
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<td>.000</td>
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<td>.165</td>
<td>.000</td>
<td>1.179</td>
<td>.196</td>
<td>.000</td>
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<tr>
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<td>.000</td>
<td>1.076</td>
<td>-.083</td>
<td>.000</td>
<td>0.920</td>
<td>-.209</td>
<td>.000</td>
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<td>.000</td>
<td>0.943</td>
<td>-.105</td>
<td>.000</td>
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<tr>
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<td>.001</td>
<td>1.015</td>
<td>.013</td>
<td>.001</td>
<td>1.013</td>
<td>.026</td>
<td>.025</td>
</tr>
<tr>
<td>Low self-control</td>
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<td>.000</td>
<td>1.076</td>
<td>.072</td>
<td>.000</td>
<td>1.075</td>
<td>.052</td>
<td>.000</td>
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<tr>
<td>Delinquent Peers</td>
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<td>.000</td>
<td>1.637</td>
<td>.489</td>
<td>.000</td>
<td>1.632</td>
<td>.802</td>
<td>.000</td>
</tr>
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</table>

*Interactions*
- LSC X Attach with Parents | .003 | .003 | 1.003 | -.0002 | .499 | .999 |
- LSC X Attach with School | .001 | .014 | 1.001 | -.0001 | .617 | .999 |
- LSC X Attach with Neigh | -.001 | .026 | .999 | -.0001 | .649 | .999 |
- LSC X Delinquent Peers | -.010 | .000 | .990 | -.005 | .000 | .994 |

| Intercept | -5.646 | -5.407 | -4.887 | -5.891 |
| N | 43,939 | 56,337 | 43,939 | 56,337 |
Table 20: Direct and Moderation Effects of Individual – Level factors on Property Crime (24 countries; 44,185 respondents without missing values and 56,674 with missing values)

<table>
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<tr>
<th>Model</th>
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<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
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<td>W</td>
<td>W/O</td>
<td>W</td>
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<td>Variables</td>
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<td>Sig.</td>
<td>EXP(B)</td>
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</tr>
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<td>Male</td>
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<td>.000</td>
<td>1.672</td>
<td>.524</td>
</tr>
<tr>
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<td>.024</td>
<td>.455</td>
<td>1.025</td>
<td>.050</td>
</tr>
<tr>
<td>Grade 8</td>
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<td>.000</td>
<td>1.115</td>
<td>.116</td>
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<td>Non-Native</td>
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<td>.377</td>
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<td>.057</td>
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<td>.000</td>
<td>.899</td>
<td>-.110</td>
</tr>
<tr>
<td>Attachment to School</td>
<td>-.044</td>
<td>.000</td>
<td>.956</td>
<td>-.055</td>
</tr>
<tr>
<td>Attachment to Neighbor</td>
<td>-.002</td>
<td>.617</td>
<td>.997</td>
<td>-.005</td>
</tr>
<tr>
<td>Low self-control</td>
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<td>.000</td>
<td>1.074</td>
<td>.069</td>
</tr>
<tr>
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<td>.000</td>
<td>1.793</td>
<td>.583</td>
</tr>
</tbody>
</table>

**Interactions**

| LSC X Attach with Parents | .003 | .009 | 1.003 | -.0002 | .630 | .999 |
| LSC X Attach with School | .001 | .286 | 1.001 | .001 | .036 | 1.001 |
| LSC X Attach with Neigh | .002 | .266 | 1.001 | n/a | .797 | 1 |
| LSC X Delinquent Peers | -.012 | .000 | .987 | -.006 | .000 | .993 |
| Intercept | -5.472 | -5.217 | -4.698 | -5.496 |
| N | 44,185 | 56,674 | 44,185 | 56,185 |
Table 21: OLS Regression Results for the respondents’ sociodemographic characteristics with Attachment to parents, school, and neighborhood as well as delinquent peers.

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<tr>
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<th></th>
<th>AN</th>
<th></th>
<th>DP</th>
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<td>B</td>
<td>Sig.</td>
<td>B</td>
<td>Sig.</td>
<td>B</td>
<td>Sig.</td>
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<td>.000</td>
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<td>.000</td>
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<td>.000</td>
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<td>.000</td>
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<td>.005</td>
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<td>.329</td>
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<td>.000</td>
<td>-.048</td>
<td>.000</td>
<td>-.003</td>
<td>.031</td>
<td>.056</td>
<td>.000</td>
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<td>.000</td>
<td>-.889</td>
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\[ R^2 \]  
N 46,625 49,923 49,914 49,286
Table 22: Indirect and Mediation Effects of Attachment and Delinquent Peers between Self-control and Violent Crime

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<th>4</th>
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<td>W/O</td>
<td>W</td>
<td>W</td>
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<td>.877</td>
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<td>.000</td>
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<td>.000</td>
<td>1.076</td>
<td>.074</td>
<td>.000</td>
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<td>.000</td>
<td>1.637</td>
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<td>.000</td>
<td>.947</td>
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<td>1.015</td>
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Table 23: Indirect and Mediation Effects of Attachment and Delinquent Peers between Self-control and Property Crime

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<td>2</td>
<td>3</td>
<td>4</td>
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<td>W/O</td>
<td>W</td>
<td>W</td>
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<td>.000</td>
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<td>.956</td>
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<td></td>
</tr>
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### Table 24: Moderation Effects of Country – Level characteristics between Individual – Level factors and Violent Crime (24 countries; 44,221 respondents)

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<td>W/O</td>
<td>W/O</td>
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<td>EXP (B)</td>
</tr>
<tr>
<td>Variables</td>
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</tr>
<tr>
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<td>.000</td>
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<td>1.286</td>
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<td>.000</td>
<td>1.071</td>
</tr>
<tr>
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<td>.000</td>
<td>1.675</td>
</tr>
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<td>.017</td>
<td>.956</td>
</tr>
<tr>
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<td>.000</td>
<td>.943</td>
</tr>
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<td>1.031</td>
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<td>-5.780</td>
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Table 25: Moderation Effects of Country – Level characteristics between Individual – Level factors and Property Crime (24 countries; 44,221 respondents)

<table>
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<th>Country Group</th>
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<th>LOW</th>
</tr>
</thead>
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<td>W/O</td>
<td>W/O</td>
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<tr>
<td>Missing values</td>
<td>B</td>
<td>Sig.</td>
<td>EXP (B)</td>
</tr>
<tr>
<td>Variables</td>
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</tr>
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<td>.000</td>
<td>1.656</td>
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<td>.602</td>
<td>1.035</td>
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<td>Grade 8</td>
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<td>.000</td>
<td>1.068</td>
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