HOUSEHOLD DISRUPTION AND SEXUAL VICTIMIZATION AMONG YOUNG SOUTH AFRICANS

by

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CHAPTER 1

INTRODUCTION

This dissertation comprises two empirical articles investigating the influence of household disruption and sexual victimization on the sexual and reproductive behavior of adolescents and young adults in South Africa, and a third article discussing the methodological limitations of the published literature on sexual victimization. While the three articles are quite distinct from each other in purpose and results, they are bound together by the common theme of trauma and disruption and a common goal of improving the quality of future research on their causes and consequences. All three articles also underscore the need to broaden the geographic scope of research on this these topics beyond the US context, to gain additional insight and strengthen existing theories.

The first article draws on theory and empirical research from several disciplines to investigate the influence of household economic and contextual disruptions on the sexual behavior of young Black South Africans. Theory and empirical research from psychology suggests that household-level change may increase the risk-taking behavior of adolescents and young adults above and beyond increases due to chronic conditions like poverty or a particular family structure. However, previous research on sexual risk behavior has generally relied on static measures of the household context, such as socioeconomic status or parental educational attainment. Psychological research also suggests that experiencing multiple changes may have a stronger influence than experiencing a single change because of the resources, emotional and otherwise, that are required to cope with each additional change. However, to date, the literature seeking to explain sexual risk-taking behavior has not addressed this possibility with sufficient

depth. Using data from a regionally-representative sample survey of adolescents and young adults in the Durban Metropolitan area of South Africa, I examine the associations between household economic and contextual disruptions and three sexual behaviors that may increase the risk of unwanted pregnancy, HIV/AIDS, and other sexually transmitted infections: current sexual activity, recent condom use, and the largest age difference with recent sexual partners. I further examine whether there are cumulative effects of these household-level disruptions; that is, whether disruptions accumulate to produce even greater effects on behavior. In spite of the strong body of theory and research supporting a relationship between household disruption and sexual risk-taking behavior, however, I find no significant associations in my analysis. I discuss data limitations that may explain the lack of significant findings and make a case for additional research on the topic.

The second article examines the relationship between sexual victimization and adolescent pregnancy among adolescent girls and young women in South Africa. Adolescent pregnancy is the most commonly studied consequence in the literature on sexual victimization, but the research is rife with methodological shortcomings that cloud our understanding of the relationship between the two phenomena. Furthermore, the relationship has been studied almost exclusively in the United States, where both sexual victimization and adolescent pregnancy are non-normative and widely discouraged by mainstream society. Studying the relationship in South Africa, where adolescent pregnancy is quite common and often supported—and sometimes even encouraged—by wider society, provides an opportunity to determine if social support for adolescent pregnancy is powerful enough to "swamp" the influence of sexual victimization on individual behavior; social norms in South Africa may well diminish differences in adolescent pregnancy between victimized and non-victimized adolescents. Further, since some scholars argue that sexual victimization has been normalized in relationships between South African men and women (Jewkes et al. 1999; Wood, Maforah and Jewkes 1998), studying the topic in this setting offers the chance to explore whether this normalization may mute its effects on subsequent behavior. This article addresses many of the methodological limitations of previous research and investigates whether studying sexual victimization in another context—South Africa—may advance theoretical

understanding of its consequences. Again using data from the Durban Transitions study, I make several important methodological improvements over previous work on this topic. I use hazard modeling techniques, which allow respondents still in the midst of adolescence to contribute appropriately to the calculation of the hazard of pregnancy during adolescence, and control for important potentially confounding variables, including family socioeconomic circumstances, household wealth, and educational attainment. My results provide mixed support for an association between sexual victimization and adolescent pregnancy. I find that respondents who describe themselves as "tricked" into their first intercourse have a significantly higher hazard of adolescent pregnancy compared to willing respondents, but the hazard for respondents who were more severely victimized (i.e., who describe themselves as forced or raped during their first intercourse) does not differ from that of willing respondents. These results suggest that the relationship between sexual victimization and adolescent pregnancy is not as straightforward as it may seem from previous research and that existing theory may need modification to account for a wider range of individual responses to sexual victimization.

The third article is a methodological critique of the published research on sexual victimization. After reviewing hundreds of articles on sexual victimization from a range of disciplines, it became clear that methodological limitations and inconsistencies in the study of sexual victimization have subverted our understanding of its causes and consequences. The article identifies some important methodological shortcomings that undermine the validity of the findings emerging from the studies, including the lack of attention to racial/ethnic diversity and other sample selectivity, problematic assumptions underlying survey questionnaires, and issues related to temporal ordering and confounding variables. In addition, the article details some of the methodological and analytical decisions made by scholars of this literature that make it difficult, if not impossible, to compare findings across studies and determine the state of knowledge on the topic. Finally, I discuss the potential contributions that scholars of sociology and demography could make to the study of sexual victimization.

COMMON THEMES

As noted above, the articles in this dissertation share the common theme of trauma and disruption and the common goal of improving the quality of future research on the topic by resolving important methodological limitations dogging the research published to date. They also share a number of other themes.

Interdisciplinary Grounding: All three articles draw upon theory and empirical research from multiple disciplines and demonstrate what can be gained by circumventing disciplinary boundaries. The household shocks article crosses disciplinary boundaries by examining household economic and contextual changes—typically studied by economists—and risky sexual behavior, typically studied by public health specialists and demographers, using theories developed by psychologists. The article on sexual victimization and adolescent pregnancy draws upon literature from psychology, social work, sociology and social demography, criminology, medicine, and public health and uses tools and theories from sociology and demography to improve upon previous research. The methodological critique of research on sexual victimization evaluates research from this same wide range of disciplines and pinpoints ways that future research could be improved, again drawing upon sociology and demography to do so.

While, as I note in the methodological critique, it is doubtful that scholars from different disciplines will ever fully agree on the one best way to define or study a topic, there is much to be gained from an interdisciplinary approach, especially in the study of a complex topic like sexual victimization. For example, psychological studies focused on individual-level characteristics and experiences could benefit from considering the mediating or moderating influences of social structure and social inequality on the individual, since both are undoubtedly involved in shaping an individual's life experiences. Similarly, studies by sociologists would better account for the influence of social structural factors on individual-level outcomes if they paid more attention to the interaction between individual-level factors, such as mental health, and social structure. Furthermore, surveys conducted by psychologists could benefit from the "best practices" of survey methodology developed and/or refined by social demographers. And studies by

economists would benefit from more attention to the **social** aspects of social structure and the individual-level factors studied most often by psychologists. This is hardly a new idea; the field of social psychology, for example, has long focused on the nexus of the individual and society for precisely this benefit. However, the continued myopia of research on sexual victimization makes it a point worth reiterating.

Adolescence and Young Adulthood: Second, the empirical articles both focus on individuals in adolescence and young adulthood, both developmentally critical life stages. They are times of preparation for adult roles—productive, reproductive, social, and civic. Decisions made during these life stages can have significant implications for the future and interference with this preparation can constrain ones' possibilities for education, employment, and family formation, with clear social and economic consequences (Lerner and Galambos 1998). McLanahan and Bumpass (1988: 134) summarize the thinking of many scholars by noting that, "disruptions in adolescence may be more harmful than early childhood disruptions, not because the emotional pain of adolescence is greater, but because behavioral responses at this stage have more lasting consequences."

The experiences and decisions of adolescence and young adulthood can also have significant ramifications for the societies in which they occur. In many low-income countries, including South Africa, adolescents and young adults comprise a large proportion of the population. Decisions they make about sexual and reproductive behavior—behaviors examined here—will shape the future structure of the population, through fertility during adolescence and mortality from HIV/AIDS. Further, since their sexual and reproductive experiences and decisions may influence other life domains, such as education and employment, they could have additional far-reaching consequences.

South African Context: The two empirical articles are based on data from South Africa, which provides a unique context in which to examine trauma and disruption because they occur at such high levels there. Estimates of the prevalence of sexual victimization range between 10 and 60 percent (Baleta 1999; CIETAfrica 2001; Jewkes and Penn-Kekana 2002; Republic of South Africa 1998). The unemployment rate is estimated to be 27 percent for all adults (Banerjee et al. 2007) and 42 percent among youth (Statistics South

Africa 2001) and death and other household disruptions and trauma are not uncommon (Ainsworth and Semali 2000; Bachmann, London and Barron 1996; Beegle, Weerdt and Dercon 2006; Case and Ardington 2006; Republic of South Africa 1998; Rutenberg et al. 2001). Consequently, increasing our understanding of their consequences may help to improve the wellbeing of a significant number of individuals.

Furthermore, social and cultural differences between South Africa and the US, where most of the similar research has been conducted, offer the opportunity to challenge expectations emerging from the literature. For example, fertility is highly valued in South Africa and childbearing during adolescence is frequently supported by parents, grandparents, and sexual partners (Preston-Whyte et al. 1990; Richter 1996; Wood, Maepa and Jewkes 1997). The fact that more than 30 percent of women have had at least one pregnancy before age 20 (Republic of South Africa 1998) reflects this widespread social support. This is in contrast to the US, where adolescent pregnancy is widely discouraged, even if not a universally negative experience (Geronimus, Korenman and Hillemeier 1994; Hoffman 1998; Hoffman, Foster and Furstenberg 1992).

And finally, the scale of the HIV epidemic in South Africa, especially among younger cohorts, makes studying the sexual and reproductive behavior of young people especially salient at this time. The prevalence of HIV among young Blacks—the focus of the research presented in this dissertation—is estimated to be 12.3 percent (Shisana et al. 2005) and many suspect that the rate of infection is increasing (Gilbert and Walker 2002; UNAIDS 2000b). Since younger cohorts are also bearing the brunt of new infections (UNAIDS 1999), infection with HIV is a very real threat for the young people in this study. I focus on sexual and reproductive behavior here because they may increase the challenges a young person faces in the transition to adulthood (Jessor 1998; Jessor, Turbin and Costa 1998a; Jessor, Turbin and Costa 1998b). In South Africa, with its high levels of HIV and other STIs and its relatively high prevalence of non-monogamy and unprotected sex among young people (Reddy et al. 2003), engaging in sexual activity at all increases ones risk of becoming infected—in addition to elevating the risk of pregnancy if contraceptives are not used. Factors like failing to use condoms or

experiencing coercive sex—more likely in relationships with large age discrepancies between partners—increase it even further (Gage 1998; Luke 2003; Luke 2005; Luke and Kurz 2002). Clearly these outcomes may have significant implications for one's physical and mental health and overall life chances. Delaying sexual activity and having safe sexual encounters (free from infection, free from coercion) increase the chance that young people will be able to take advantage of growing opportunities in the "new" South Africa.

CHAPTER 2

HOUSEHOLD SHOCKS AND THE SEXUAL BEHAVIORS OF YOUNG BLACK SOUTH AFRICANS

The scope of the HIV epidemic in South Africa and the degree to which the epidemic is centered upon young people (Gilbert and Walker 2002; UNAIDS 2000a) has given a new urgency to efforts to understand the many influences on young people's risky sexual behavior. While researchers have long noted the influence of family and household characteristics on sexual behavior (Brewster 1994; Brewster, Billy and Grady 1993; Browning, Leventhal and Brooks-Gunn 2004; Dornbusch et al. 1985; Flewelling and Bauman 1990; Hallman 2004; Hogan and Kitagawa 1985; Lauritsen 1994; Pettifor et al. 2004; Thomas, Farrell and Barnes 1996; Wu and Thomson 2001), the potential impact of changes or disruptions in the household context have gone largely unexplored.

Other research suggests that changes in family structure, household income, and residence increase the risk of substance use, poor psychosocial outcomes, and school dropout (Adam and Chase-Lansdale 2002; Astone and McLanahan 1994; DeWit 1998; Duryea, Lam and Levison 2007; Lloyd, Mete and Grant 2006; Okun, Parker and Levendosky 1994; Osborne and McLanahan 2007; Wu 1996; Wu and Martinson 1993; Wu and Thomson 2001). It seems plausible that such disruptions may be associated with increased sexual risk-taking behavior as well, by increasing stress, reducing parental monitoring, increasing poor parental role modeling, and encouraging transactional sex. To date, however, studies of associations between household characteristics and sexual behavior have generally relied on static measures of household characteristics—snapshot measures such as socioeconomic status or family structure. Few have examined the potential influence of household shocks—changes or disruptions in the household context—on the sexual behavior of young people. This has left intervention programs and policy makers with an incomplete "tool box" with which to identify and assist especially vulnerable groups.

In addition, a separate body of literature has found a dose-response relationship between different negative conditions, or "risk factors"—static conditions such as living in

poverty or in a single-parent household—and the risk of behavioral problems, low self-esteem, mental health problems, and poor educational outcomes (Appleyard et al. 2005; Gerard and Buehler 2004; Rutter 1979; Sameroff et al. 1998; Simmons et al. 1987), such that the risk of a negative consequence rises with each additional negative condition. The same cumulative relationship might well exist between household disruptions and sexual risk-taking behavior, but research examining this possibility is lacking.

This article addresses both of these gaps in the literature using data from a panel study of young Black South Africans.[1] I examine the influence of household economic and contextual shocks—such as death, job loss, and residential relocation—on a range of sexual behaviors that increase the risk of acquiring HIV and other sexually transmitted infections. In particular, I examine whether associations exist between sexual risk-taking behavior and experiencing any household disruption as well as whether there are cumulative effects of such disruptions. A more dynamic approach to the household environment may provide additional insight into the behavior of young people and provide direction for policies, prevention efforts, and future research.

I. BACKGROUND/SIGNIFICANCE

A. WHY HOUSEHOLD SHOCKS MIGHT MATTER

Household economic and contextual disruptions may influence young people's sexual behavior in a number of ways. First, social stress theory suggests that household disruptions produce disequilibriums in the family system and stress for individual household members. [See Aneshensel (1992) and McLanahan and Bumpass (1988) for overviews of this literature.] This stress may influence young people directly through changes in the emotional context or level of support provided by the household or through the strategies the household employs to deal with the disruption or "smooth the shock." It may also influence young people indirectly by increasing their parents' stress

[1] Under the apartheid system (1948-1994), South Africans were officially assigned to one of four population groups: Black or African, Coloured, Asian, or White. I use these labels here because the legacy of population group-based policies persists; they still index groups' relative rankings within the social structure (Kaufman and Stavrou 2002).

(Deleire and Kalil 2002). In the face of the death of a parent or other family member, for example, young people may have to renegotiate relationships with a surviving parent or adjust to the loss of a significant source of emotional support. In response to economic shocks, parents may pull their children out of school, sending them to work or increasing their responsibilities around the home (Duryea 1998; Duryea, Lam and Levison 2007; Lloyd, Mete and Grant 2006), or move the household to a less-expensive neighborhood or closer to employment opportunities. In each of these situations, the young person would face the loss of familiar routines and relationships and would be required to adjust to new situations, relationships, and/or responsibilities. Because young people generally look to their families for emotional and economic security, these changes may cause them considerable stress and may undermine their support networks. Engaging in sex—and taking risks with sex—may be one way of coping with the added stress of such adjustments (Kaufman et al. 2004). The stress may also make them more vulnerable to sexual advances or coercive sexual practices (Gage 1998).

Similarly, parents may change their own sexual and substance use behavior in response to household stressors (Lambert et al. 2004), which in turn may influence the young people in their households in at least two ways. Parents' behaviors provide their children with behavioral examples; previous research demonstrated that such examples can have an important influence on young people's own behavior (e.g., Denton and Kampfe 1994; Wilder and Watt 2002), in part because children model their sexual behavior on that of salient others (Gagnon and Simon 1999). For example, one study notes that Black South African adolescents often disregard adults' warnings against sexual activity because the adults' promiscuous sexual behavior contradicts their admonitions (Preston-Whyte 1994). Parents' ability to monitor and supervise their children may also be compromised if they engage in substance use or risky sexual behavior, increasing opportunities for young people to engage in sexual activity. Substance use may impair parents, rendering them incapable of supervising their children, while pursuing a sexual relationship may take them out of the household and leave them out of touch with the comings and goings of their children. Monitoring and supervision may also be reduced if parents or other household members have to increase their working hours to cope with household

disruptions (Wu and Thomson 2001) or if they die or abandon the household. Since greater parental monitoring is associated with reduced sexual activity, an older age at sexual debut, and increased condom use (Browning, Leventhal and Brooks-Gunn 2004; Hogan and Kitagawa 1985; Miller 1998; Rodgers 1999; Small and Luster 1994; Wight, Williamson and Henderson 2006), the loss of this monitoring may be important for increasing risky sexual behavior.

In addition, the stress of household shocks may strain the parent-child bond, encouraging young people to seek emotional support and intimacy elsewhere and perhaps hastening their entry into sexual activity (Agnew 1992; Agnew 1993; Hetherington and Clingempeel 1992; Wu 1996; Wu and Martinson 1993; Wu and Thomson 2001). For example, previous research has found that one key way that economic stresses influence young peoples' behavior is through changes in parenting styles and practices. Parents under stress are more likely to use punitive discipline, to discipline inconsistently, and to ignore children's emotional needs (Deleire and Kalil 2002; Ge et al. 1992; McLoyd 1998). In response, children may disengage from the household and seek emotional intimacy and support elsewhere, such as in sexual relationships.

Furthermore, previous research has determined that significant socioeconomic inequalities between partners can produce power differentials that reduce the ability of the poorer individuals to negotiate condom use or whether sex takes place at all (Gage 1998; Mensch, Bruce and Greene 1998). Since household shocks may exacerbate or cause such socioeconomic inequalities, they may be directly or indirectly implicated in increasing sexual activity and reducing condom use.

Finally, household economic shocks may encourage young people—especially girls—to exchange sex for food or school fees or material goods they can no longer afford (Kaufman and Stavrou 2002; Leclerc-Madlala 2003; Luke 2005; Nyanzi, Pool and Kinsman 2001; Silberschmidt and Rasch 2001; Wood and Jewkes 1997). This may be particularly true in South Africa, where such transactional relationships are common and culturally distinct from prostitution (Dunkle et al. 2004; Luke 2003; Luke 2005). Because individuals who can offer money and gifts in exchange for sex are likely to be older and

wealthier than their partners, inequalities in age and socioeconomic status may leave the younger or poorer partner vulnerable to exploitative or coercive sexual practices and leave them with little power to negotiate the terms of their sexual activity (Gage 1998). In addition, many, if not most of the individuals who provide material goods in such relationships refuse to use condoms, and the material benefits they offer give them more power to assert their wishes (Kaufman and Stavrou 2002; Luke and Kurz 2002). Not surprisingly, then, previous research has found that transactional sexual relationships reduce the likelihood of condom use and contraception and increase the risk of coercion and sexually transmitted infections (Dunkle et al. 2004; Kaufman and Stavrou 2002; Luke 2003; Luke and Kurz 2002).

While it is doubtful that any one process or pathway of influence can be strictly isolated from the others, I explore these possible relationships among South African young people.

B. RELATED RESEARCH

Several separate bodies of literature have produced empirical findings relevant to this study—the literatures on family and household influences on sexual behavior, on the influence of household disruptions on youth outcomes, and on the cumulative effects of household risk factors. The scope of this literature makes it difficult to summarize in an article of this length, but suffice it to say that each literature leaves gaps that are addressed by this study. I briefly discuss each relevant body of literature below.

a. Family and Household Influences on Sexual Behavior

Studies on family- and household-level influences on sexual behavior of young people have found that characteristics like family socioeconomic status, household size, and family structure are associated with early sexual debut, inconsistent condom use, a greater number of previous sexual partners, nonmarital pregnancy, and related outcomes (Brewster 1994; Brewster, Billy and Grady 1993; Browning, Leventhal and Brooks-Gunn 2004; Dornbusch et al. 1985; Flewelling and Bauman 1990; Hallman 2004; Hogan and

Kitagawa 1985; Lauritsen 1994; Pettifor et al. 2004; Thomas, Farrell and Barnes 1996; Wu and Thomson 2001). As noted above, one weakness of this research is that it has generally used static measures of household and family characteristics.

The only disruption that has received much attention in this literature is parental relationship disruption—including divorce, remarriage, and changes in the formation and termination of cohabiting relationships (Capaldi, Crosby and Stoolmiller 1996; Cockett and Tripp 1994; Fomby and Cherlin 2007; McLanahan 1985; Osborne and McLanahan 2007; Woodward, Fergusson and Horwood 2001; Wu 1996; Wu and Martinson 1993). Although this type of disruption is less relevant in South Africa because of relatively low rates of marriage and nonmarital cohabitation (Hallman 2004; Republic of South Africa 1998), these studies have demonstrated that such changes tend to increase children's risky sexual behavior and generally have detrimental effects on child well-being—suggesting that further investigation of household change more broadly defined is warranted. However, one shortcoming of these studies is that they have generally considered family disruption in isolation from other household or family changes, even though several scholars note that relationship disruptions are often followed or accompanied by other changes, including residential moves, school changes, and disruptions in relationships with non-custodial parents (Buchanan, Maccoby and Dornbusch 1996; Cherlin et al. 1991; Furstenberg and Cherlin 1991). An exception is a study by Wu (1996), which addresses the influences of **both** parental relationship disruption itself and the associated income declines on nonmarital birth. Wu finds that changes in income and family structure have independent effects on the risk of nonmarital birth. However, the study does not address income changes from other causes or other types of family structure change, such as death. Given the potential significance of family and household factors on young people's sexual behavior and the significant findings from the limited research on the effects of disruptions, this topic warrants further attention. Garnering a more complete picture of household dynamics can only help to clarify the ways in which they exert their influences on young people.

b. The Influences of Household Shocks

Research by economists has examined the influence of household economic shocks like job loss, environmental shocks with economic implications (e.g., floods), death, and unwanted pregnancy to determine their influences on young people in the household. Many studies have found that households respond to such shocks by pulling children out of school, sending them to work, or increasing their responsibilities in the home (Duryea 1998; Duryea, Lam and Levison 2007; Lloyd, Mete and Grant 2006; McLoyd 1990). Parental job loss has received the most attention in this literature. Though the results are far from unequivocal, studies have generally found that young people experiencing shocks are more likely to drop out of school and to engage in problem behaviors (See McLoyd 1998 for a review of this literature). As noted above, these influences appear to occur primarily due to the stress that job loss causes parents. Parents' stress levels often increase in response to a job loss, which in turn may limit their ability to provide their children with emotional support and alter their disciplinary practices (Deleire and Kalil 2002; Ge et al. 1992; McLoyd 1998). The South African economic sector is characterized by high levels of unemployment and instability, especially among Blacks (Banerjee et al. 2007); thus job loss may be a particularly relevant shock to examine there.

Death has also received attention in the household shocks literature, especially in sub-Saharan Africa because of the high prevalence of HIV-related morbidity and mortality. Much of this research has focused on the loss of one or both parents and has found associations with poorer health and educational outcomes among children (e.g., Ainsworth and Semali 2000; Beegle, Weerdt and Dercon 2006; Case and Ardington 2006). However, the illness or death of someone in the household other than a parent may also cause disruption in young people's lives; grandparents, for example, are a part of many South African households and the loss of a grandparent may cause significant stress to a young person, with consequent effects on his/her behavior. Parents or other household members may also have to spend considerable time caring for an ill household member, reducing the amount of attention and supervision they offer to young people in the household, and perhaps inhibiting emotional closeness with them. It is important to note that even before the escalation of the HIV epidemic, death and illness were far from

uncommon in South African households. In addition to mortality from infectious diseases, maternal and infant mortality and heart disease are still relatively common (Bachmann, London and Barron 1996; Burgard and Treiman 2006; Republic of South Africa 1998).

Scholars of sociology, psychology, and education have examined the influence of another common household disruption—residential relocation—on young people because of its prevalence. Much of this research has found that young people who move at least once have lower educational attainment (Ingersoll, Scamman and Eckerling 1989) and an increased risk of school dropout (Astone and McLanahan 1994) as well as an increased risk of delinquency (Adam and Chase-Lansdale 2002) and substance use (DeWit 1998). Though the proposed explanations vary, most suggest some variant of social stress theory, which posits that moving away from a familiar environment, peers, and support networks and adapting to a new situation and forming new relationships causes considerable stress to a young person, especially since peers and schools are such central parts of this life stage. This stress can undermine attachment to and support from parents (who are undergoing similar stresses from relocation), reduce attachment to school, and may encourage young people to seek emotional support from outside the family. In addition, young people anxious in a new environment may engage in risky behaviors like delinquency, substance use, or sex to gain acceptance from new peers or reduce social anxiety. While theoretically, relocation may remove a young person from detrimental situations, such as delinquent peers or poor quality schools, stress theory suggests that the required adjustments from even a "positive" relocation may be enough to produce negative consequences for young people (Boyle et al. 2008; Osborne and McLanahan 2007). Nevertheless, there is considerable evidence to suggest that residential relocation may increase sexual behavior—and especially risky sexual behavior—as well.

The main shortcomings of this research are that they have not generally examined influences on sexual behavior (however, see Dinkelman and colleagues (2007) for an exception, discussed in detail below), nor have they addressed the potential of cumulative influences in any systematic way. The present study extends this research by examining

the potential influence of a broad array of household shocks on sexual behaviors and by investigating the potentially cumulative effects of multiple shocks (more on this below).

c. Cumulative Effects of Household Risk Factors

Another body of research has examined the effects of an accumulation of negative conditions or "risk factors," such as living in poverty, on the risk of poor educational outcomes, behavioral problems, low self-esteem, and other problems with mental health and psychological development (Appleyard et al. 2005; Gerard and Buehler 2004; Rutter 1979; Sameroff et al. 1998; Simmons et al. 1987; Turner and Lloyd 1995). The explanations posited by researchers for these findings are complex, but the general idea is that each negative condition or characteristic undermines the ability of a child or adolescent to develop coping mechanisms, progress through developmental stages in an age-appropriate manner and constrains their development of human and social capital (Garmezy 1991; Garmezy 1993). Each additional condition exacerbates these issues even further, producing the cumulative effect found in many studies (Appleyard et al. 2005; Gerard and Buehler 2004). The important distinction separating the cumulative risk perspective from other theories of risk is that it is not a particular array of risk factors but the number of risk factors to which someone is exposed at a given point in their development that produces the negative consequences (Gerard and Buehler 2004).

Research in this vein has focused primarily on psychosocial outcomes; it has generally not addressed the possibility of influence on sexual behavior. Moreover, while some studies have included disruptions in the family or household as risk factors (Appleyard et al. 2005; Okun, Parker and Levendosky 1994; Rutter 1979), most have included only—or mainly—static characteristics or life circumstances thought to increase vulnerability to negative consequences. As in the literature on family and household influences described above, the single or most common disruption included was a change in family structure due to divorce; these studies have found that multiple changes in family structure have greater negative effects on child well-being than single changes or no changes at all (Fomby and Cherlin 2007; Wu and Thomson 2001). Thus, household disruptions may be important risk factors to examine and a similar cumulative relationship may hold between

household disruptions and sexual behavior. The present study builds upon this literature by examining the potential cumulative effects of household disruptions on sexual behavior—that is, whether an index of disruptions is associated with increases in risky behavior—as well as whether there is an effect of experiencing any household disruption.

A recent study by Dinkelman and colleagues (2007) is an exception to the generalizations I have made above about the related literature. That study examined the associations between household shocks and HIV-related sexual risk behavior among adolescents and young adults in the Cape Area of South Africa and, notably, found a small but statistically significant association between condom use and experiencing a household shock in the previous two years. However, the study contains a number of limitations that are addressed by the present study. First, the analysis only includes shocks that were reported to have considerable financial impact on the household. As noted above, financial impact is only one of the pathways through which young people's sexual behavior may be influenced by household shocks; the loss of emotional support or reduced parental monitoring, for example, may be equally important influences on sexual behavior. Furthermore, this study only examines the potential impact of experiencing any one of the three most commonly reported shocks. This broad-brush accounting of the experience of household shocks may obscure nuances in the relationship and does not allow for the possibility of a cumulative relationship between the number of shocks and the level of risk. While the research is an important contribution to the literature on this topic, the present study extends this and related research in several ways. First, I examine the influence of a wider range of household disruptions, including residential relocation and the theft or destruction of significant household property, and do not distinguish between shocks that had a significant financial impact on the household and those that did not. This is important because of the prevalence of different shocks in the lives of South African young people (Rutenberg et al. 2001) and because, as discussed above, household disruptions may influence sexual behavior in numerous ways, not just through the financial impact. Second, the present study includes residential relocation, a disruption that may be especially salient to young people because it may entail changes in schools and peer groups and may require significant adjustments. Third, this study pays

closer attention to the timing of household disruptions vis à vis the sexual behaviors in question; the behaviors examined in the Dinkelman study could have preceded the experience of household shocks by as much as two years, which increases the potential risk of recall bias and significantly weakens any causal claims. And finally, this study investigates the potential for cumulative effects, which, if significant, would aid in the identification of especially vulnerable groups of young people.

C. THE IMPORTANCE OF GENDER

Gender is an important consideration when examining the potential influences on young people's sexual behavior, for several reasons. First, young men and women engage in sexual behavior at different levels in most societies; in South Africa, 50 percent of young Black males had ever had sex compared to only 34 percent of young Black females (Reddy et al. 2003), a difference that persists into young adulthood (Rutenberg et al. 2001). While a wide range of factors undoubtedly contribute to these differences, the literature on gender socialization suggests that girls are supervised more carefully than boys are (Black, Ricardo and Stanton 1997; Davis and Davis 1989; Li, Feigelman and Stanton 2000; Svensson 2003 although see Browning et al. (2004) for a null finding), starting in childhood but often intensifying during adolescence and young adulthood when gender and reproductive roles become more salient. This difference in supervision may stem from the perception (or reality) that girls are more vulnerable or from the fact that the potentially negative consequences of sexual activity—unintended pregnancy, disrupted schooling, sexual victimization, and reduced marriage prospects—are generally borne more by girls than by boys. Consequently, parents may restrict girls' movement more than they do boys' (Mensch, Bruce and Greene 1998; Nathanson 1993). South African parents may be especially motivated to monitor their daughters because of the high levels of violent crime, coerced sex, and adolescent pregnancy in South Africa (Burton et al. 2003; Republic of South Africa 1998).

Different gender role expectations of males and females may also shape the strategies employed by a household to "smooth" the economic or contextual shocks—with both direct and indirect implications for the sexual behavior of young people in such

households. For example, Lloyd and her colleagues (Lloyd, Mete and Grant 2006) found that boys were more likely to drop out of school after the household lost a source of remittances, presumably because they could get a job to replace the household's lost income, while girls were more likely to drop out of school in response to an unwanted pregnancy in the household, presumably because they were expected to help out at home. In addition, girls may be more likely than boys to seek out transactional sexual relationships as a result of household shocks, and in fact may be encouraged or pressured by their families to do so (Luke and Kurz 2002; Meekers and Calvès 1997). While transactional relationships between young males and older women (called "sugar mummies") are not unknown in the region, "sugar daddy" relationships between girls or women and older men are much more common (Kaufman and Stavrou 2002). Transactional relationships are often characterized by considerable age and socioeconomic inequality; although the exchange of sex for material goods or money does occur between age peers, it is more common between younger females and older, wealthier men (Kaufman and Stavrou 2002). As noted above, the exchange of money or material goods for sex is also associated with the less frequent use of condoms (Kaufman and Stavrou 2002; Leclerc-Madlala 2003; Luke and Kurz 2002). Kaufman and Stavrou (2002) found, for example, that among Black South African adolescents, if a girl accepted material goods before having sex with a partner, she ceded her right to insist on condom use, and another study found that condom-less sex had a higher monetary value in an exchange relationship than sex with a condom (Leclerc-Madlala 2003). Furthermore, inequality in age or socioeconomic status between partners in a transactional relationship may reduce girls' ability to negotiate whether condoms are used (Gage 1998). Thus because of potentially different gender role expectations and opportunities, girls may be more likely to have sex in response to a shock and more likely to have unprotected sex. Consequently, investigating an interaction with gender is important in understanding the potential influence of household shocks.

D. THE SOUTH AFRICAN CONTEXT

Several factors make the South African context an interesting one for studying the dynamics of adolescent and young adult sexual activity. With the unemployment rate for

young South Africans estimated at 42 percent (Statistics South Africa 2001), the possibility of improving one's socioeconomic status may seem unlikely to young people there. Moreover, the limited availability of organized activities, such as sports teams and clubs, coupled with widespread poverty may leave young people with considerable unstructured time and little to do beyond "hanging out" (Kaufman and et al. 2004). As a result, young people may be bored, hopeless, and disillusioned—and perhaps in search of "alternative expressions of self-worth," which may manifest as risky behavior involving sex (Petersen et al. 2004: 295).

Moreover, adults around them may provide few role models who demonstrate the advantages of refraining from risk-taking or deferring parenthood (Jencks and Mayer 1990; Leventhal and Brooks-Gunn 2000). Many South African adults engage in risky sexual activity themselves (Preston-Whyte 1994) and more than 30 percent of women have at least one pregnancy before age 20 (Republic of South Africa 1998). In addition, fertility is highly valued in South Africa and childbearing during adolescence is frequently supported and/or explicitly encouraged by young women's parents, grandparents, and sexual partners (Preston-Whyte et al. 1990; Richter 1996; Wood, Maepa and Jewkes 1997); many young women can rely on their families for childcare and support while they continue school or seek employment outside the home (Kaufman, de Wet and Stadler 2000). In addition, while the national Child Support Grant, a means-tested grant to support children through age 14, may not serve as a catalyst for early pregnancy (Makiwane and Udjo 2006), it does help to ensure that those experiencing early pregnancies will not be completely without financial support.

Taken together, these factors may leave young people with few incentives to postpone or forego sexual pleasure or prevent pregnancy and disease (Gage 1998). Furthermore, it may reduce the likelihood of observing large differences in sexual behavior among the young people in this sample. Nevertheless, further attention to the potential influence of household disruptions may increase our ability to explain variations in sexual activity among young people and give us additional leverage in efforts to reduce sexually risky behavior among young people.

This analysis focuses on Black/Africans, in part because the small numbers of respondents from other racial or "population" groups in the available data make meaningful analysis of other groups impossible. However, there are important substantive reasons to focus on this group as well. First, Blacks/Africans are the largest and most disadvantaged population group in South Africa; the vast majority are poor and live in communities with poor infrastructure and services (Statistics South Africa 2007) and low average levels of socioeconomic resources (Treiman, McKeever and Fodor 1996). As a result, young Blacks may have more stressors and fewer resources with which to cope with household disruptions than members of population groups (Gerard and Buehler 2004; Jessor, Turbin and Costa 1998a; Jessor, Turbin and Costa 1998b). Second, Blacks comprise the vast majority of adolescents and young adults in the country. Since young people under age 24 comprise almost 30 percent of the population (Population Reference Bureau 2006), the choices this group makes with respect to sexual risk-taking and fertility will have significant consequences for the rest of the country. And finally, Black youth are most severely affected by the country's HIV epidemic—an estimated 12.3 percent of Blacks aged 15-24 are infected with HIV (Shisana et al. 2005) and younger cohorts bear the brunt of new infections (UNAIDS 1999). Understanding the many influences on young people's sexual behavior may help to slow the HIV epidemic.

E. WHY IT MATTERS

The question of whether household shocks influence young people's sexual behavior is significant for many reasons, but I emphasize one in particular. Adolescence and young adulthood are developmentally critical life stages. They are times of preparation for adult roles—productive, reproductive, social, and civic. Decisions made during these life stages can have significant implications for the future and interference with this preparation can constrain ones' possibilities for education, employment, and family formation, with clear social and economic consequences (Lerner and Galambos 1998). McLanahan and Bumpass (1988: 134) summarize the thinking of many scholars of adolescence by noting that "disruptions in adolescence may be more harmful than early childhood disruptions, not because the emotional pain of adolescence is greater, but because behavioral responses at this stage have more lasting consequences."

Sexual behavior may be particularly consequential during adolescence and young adulthood. Although sexual activity in these life stages is not unambiguously risky—without knowing a great deal more about the context and the individuals involved, it is impossible to determine if sexual activity is risky or simply a step in the development of healthy sexuality—it can have a number of negative consequences. Sexual activity during adolescence and young adulthood increases the risk of sexually transmitted infections (STIs), unwanted pregnancy, and coerced sexual experiences (Alan Guttmacher Institute 1996; Alan Guttmacher Institute 2006; Tubman, Windle and Windle 1996). Early age at sexual debut is also associated with diminished mental health, delinquency, and other problem behaviors (Meier 2007; Resnick et al. 1997).

It is the scale of the HIV epidemic among young South Africas, however, that makes this study especially salient in this context. Infection with HIV is a very real threat for the young people in this study. I focus on three sexual behaviors in this analysis—current sexual activity, having unprotected sex, and the age difference with recent sexual partners—to examine behaviors that may increase the challenges in the transition to adulthood (Jessor 1998; Jessor, Turbin and Costa 1998a; Jessor, Turbin and Costa 1998b). In South Africa, with its high levels of HIV and other STIs and its relatively high prevalence of non-monogamy and unprotected sex among young people (Reddy et al. 2003), engaging in sexual activity at all increases ones risk of becoming infected—in addition to elevating the risk of pregnancy if contraceptives are not used. Failing to use condoms or experiencing coercive sex—more likely in relationships with large age discrepancies between partners—increases it even further (Gage 1998; Luke 2003; Luke 2005; Luke and Kurz 2002). Clearly these outcomes may have significant implications for one's physical and mental health and overall life chances. Delaying sexual activity and having safe sexual encounters (free from infection, free from coercion) increase the chance that young people will be able to take advantage of growing opportunities in the "new" South Africa.

In light of this research and conditions in contemporary South Africa, I address two research questions in this study. First, are household shocks associated with three sexual

behaviors that increase the risk of HIV infection, including recent sexual activity, having unprotected sex, and having sex with older partners? Second, are there cumulative effects of additional household shocks on these behaviors? I examine these questions among a large sample of young Black South African females and males. In the next section, I describe the specific outcomes to be examined in more detail as well as the methods, measures, and strategy used in the analysis.

II. THE PRESENT STUDY

A. DATA

This paper uses data from a panel study of young people in South Africa, the Transitions to Adulthood in the Context of HIV/AIDS study (hereafter, the Durban study) (Rutenberg et al. 2001). The Durban Transitions study was conducted on an initial sample of approximately 3,100 young people ages 14-24 in two districts within KwaZulu-Natal Province, Durban Metro and Mtunzini Magisterial District. A modified stratified, multi-stage cluster sampling method was used with census enumeration areas from the 1996 Census serving as the primary sampling unit. The first wave of interviews was conducted in 1999 with all willing young people aged 14–24 years within each census enumeration area (see Rutenberg et al. (2001) for more on study design). The individual interview asked questions about sexual behavior, reproductive health, and a range of other behaviors. In addition, the household head or other responsible adult in the household was interviewed about the household's residents, sociodemographic characteristics, amenities, and recent economic and contextual shocks. The individual respondents were re-interviewed in 2001, as was a new group of young people from the same sampling frame. Because of the study design, individual respondents can be grouped as follows: those who were interviewed in Wave 1 and were lost to follow-up (Group 1); those who were interviewed in both Wave 1 and Wave 2 (Group 2); and those who were interviewed in Wave 2 as part of the replacement sample (Group 3).

B. METHODS

I use two different analytic approaches to take advantage of the strengths of the available data and to minimize its limitations, thereby maximizing the understanding that can be gained. Because of differences between the analytic approaches used, the samples and measures differ slightly from one another; thus I describe the final samples and models used in each approach below and the measures in the following sub-section. However, for both approaches, I excluded White, Indian, and Coloured respondents as there were not enough respondents of these population groups to conduct meaningful analysis. Further, because so few in this age group are married (2%) or have set up independent households (less than 4%), I excluded married respondents and those who report themselves to be heads of household or the spouse of a household head. The analysis for current sexual activity and unprotected intercourse use logistic regression and the analysis for the age difference with recent sexual partners uses linear regression. All models are weighted to adjust for the complex survey design and are conducted separately by sex.

a. Approach 1

This analysis takes advantage of the fact that both the sexual outcomes and household shocks were measured in each survey wave. Consequently, Group 2 respondents, who appeared in both waves, have two observations of each sexual behavior while respondents in Groups 1 and 3, who appear in only one wave, have one observation available. To capitalize on these additional observations and maximize the sample size, I "stacked" the data from all three groups of respondents, treating the repeated observations from Group 2 as separate observations and correcting the standard errors to adjust for the non-independence of the observations. This approach maximizes the sample size and minimizes the bias that may be introduced by the selective loss to follow-up of using only respondents who appear in both waves of the data. Household shocks occurring in the 24 months before the given survey wave are included in this analysis; analyses tested two different shocks variables, a categorical count variable and a bivariate indicator (explained in further detail below). Models for current sexual activity are estimated for all respondents separately by sex (N=2,710 females and 2,237 males)

(Tables 2-3 and 5-6) as well as only among those who reported ever having had sex (N=1,504 females and 1,437 males), in recognition of the possibility that the decision to have sex for the first time may differ from the decision to remain sexually active (Tables 4 and 7). Models for unprotected intercourse and greatest age difference with recent partners include only respondents with complete information who report that they were sexually active in the previous month to minimize recall bias (respectively, N=803 and 926 females and 812 and 799 males) (Tables 2-3).

b. Approach 2

As noted above, the data include two measures of household shocks for respondents appearing in both waves of the survey—those occurring in the 24-month period before Wave I (hereafter, "early shocks") and those occurring in the 24-month period before Wave II (hereafter, "recent shocks"). Since shocks occurring in each period may influence young people's behavior, and because 24 months is a rather arbitrary length of time, this approach combines the shocks from both periods and analyzes their potential influence among respondents appearing in both survey waves. This Approach has two main limitations. First, the sample size available for the analysis is considerably smaller than the sample used in Approach 1. This limits my statistical power and thus my ability to detect small effects of the variables in question. The second concerns the potential selective loss of respondents to follow-up in Wave 2, which may bias the results. A comparison of the respondents who appeared in Wave 1 but were subsequently lost to follow-up and those who were retained across both waves (not shown) indicates that those lost to follow-up experienced slightly more shocks before Wave 1 than those who were retained in Wave 2 (1.25 shocks vs. 1.03 shocks), but this difference was only marginally statistically significant ($p < .10$). As above, models for current sexual activity are estimated for a categorical shocks variable and a bivariate shocks variable. Models for current sexual activity are estimated for all respondents separately by sex (N=853 females and 703 males) (Tables 8-9 and 11-12) as well as only among those who reported ever having had sex (N=596 females and 575 males) (Tables 10 and 13). Models for unprotected intercourse and age difference with recent partners include only those

respondents with complete information who were sexually active in the previous month (respectively, N=308 and 378 females and 331 and 338 males) to minimize recall bias.

C. MEASURES

a. Dependent Variables

The three dependent variables, currently sexually active, unprotected intercourse with recent sexual partners, and the age difference with recent sexual partners, were drawn from responses from the adolescents and young adults. In Approach 1, the dependent variables were measured for the one-month period prior to each survey interview to minimize the potential overlap with the period during which the household shocks were measured. For Approach 2 models, the dependent variables were measured in the one-month period before Wave 2.

Currently Sexually Active. In the context of high HIV-prevalence, the transition to sexual activity is a marker of significantly increased risk of infection. This dichotomous variable indicates whether the respondent had sexual intercourse within the month prior to the survey interview (coded 1=Yes). As noted above, I estimate logistic regression models for this variable among all respondents as well as among only those who report that they have had sex at least once.

Unprotected Intercourse. This dichotomous variable indicates whether the respondent used a condom during his/her last episode of sexual intercourse within the month prior to the survey interview (coded 1=No condom used). I estimate logistic regression models for this variable among respondents who were sexually active within the previous month.

Age Difference with Recent Partners. This variable indicates the extent of age asymmetry between respondents and their recent sexual partners; this may be an important indication of power differences between partners and may in fact indicate that the relationship is a transactional one, since many transactional relationships involve significant age asymmetries (Luke 2003). This variable may operate differently for males and females; I anticipate that males experiencing household disruptions will engage in

sex with significantly younger partners—an attempt to exert control in their lives in some way when other parts of their lives are out of control, while females experiencing shocks may seek relationships with older partners who may be able to provide more material goods to cope with the disruptions in their lives. This continuous variable indicates the largest age difference between the respondent and any of up to three of his/her sexual partner(s) in the month prior to the interview. I estimate OLS regression models for this variable among respondents who were sexually active within the previous month.

b. Independent Variables.

Household Shocks. The household shocks variables were drawn from two sources, the interview(s) with the head(s) of the household in which the young person resided or another responsible adult in the household and the interview(s) with the young person her/himself. The household head or other responsible adult was asked whether different economic and contextual shocks occurred in the household any time during the 24 months prior to the survey. In addition, the young people were asked if they had experienced a residential move during this same period. I focus on the five most common shocks as these shocks affect a relatively large proportion of households in the sample[2]:

1. Death of a household member or other family member
2. A serious injury or illness that kept a household member from doing normal activities
3. The loss of a regular job by someone in the household
4. Serious theft, fire, or destruction of household property
5. Residential move

For Approach 1, I created two different variables to measure the experience of household shocks, one to indicate the occurrence of any shock in the period and the other to indicate the number of shocks. First, I created a binary variable (hereafter, the "any shock" variable) to indicate whether the respondent's household experienced any household shock in the 24-month period prior to a given survey wave (1=yes). Second, I summed the number of household events that occurred in that period to produce a variable with a possible range from 0 to 5. Because the distribution of this variable was highly skewed, I created a three-category variable (hereafter, the "categorical shocks" variable) by

[2] A similar strategy was used by Dinkelman and colleagues (2007).

collapsing the values for respondents who had experienced 2 or more events into one category. For Approach 2, the two household shocks variables were constructed slightly differently. I constructed a binary variable indicating whether the respondent experienced any household shock in either the 24-month period before Wave I or in the 24-month period before Wave II (1=yes). The second variable is a simple sum of early and recent shocks (with a possible range of 0 to 10).

c. Control Variables.

Age. I include age as a continuous variable in each model because the prevalence of sexual behavior rises with age (Reddy et al. 2003) and because the factors influencing decisionmaking about sexual behavior may vary by age (Gage 1998).

At or Above Expected Grade for Age. Previous research has found that education is significantly associated with sexual risk-taking behavior, with respondents who are not enrolled in school or who have experienced schooling delays more likely to be sexually active earlier, less likely to use condoms, and more likely to have sex with significantly older partners (Hallman 2004; Kaufman et al. 2002; Luke 2003). Consequently, I control for the respondent's education by including a variable indicating whether he/she was at or above the expected grade level for age 24 months before the observation; this replicates the period during which the household shocks were measured. Because of the possible endogeneity of respondent's education and household shocks, I cannot include respondent's education level at the time of the survey.

Household Wealth. Because other studies have found an association between lower socioeconomic status and increased sexual risk-taking behavior (Hallman 2005; Hallman and Grant 2004), household assets are measured with an index of household amenities, including materials used to construct the roof and walls of the home, the type of toilet facilities and water supply, access to electricity, and ownership of a telephone. The "alpha" command in Stata 8.0 SE was used to create an index, with values for each item standardized and summed; the Cronbach's alpha value for the index is 0.80 and the range is -1.95 to 0.82.

Family Structure. Because previous work has found family structure to be associated with a wide range of sexual behaviors (Browning, Leventhal and Brooks-Gunn 2004; Dallimore 2000 (unpublished); Dinkelman, Lam and Leibbrandt 2007; Hallman 2004; Wu and Thomson 2001), I include a three-category variable to measure family structure, indicate whether the respondent lived with both biological parents at the time of the survey, one biological parent (either the mother or the father only), or with neither biological parent. Sample size does not permit me to create a variable with separate categories for coresidence with the father or the mother. This measure is not ideal, as it is measured at the time of the survey, that is, after the household shocks occurred; thus it cannot be considered part of the "causal chain" of sexual behavior unless family structure remained constant during the 24 months before the survey. Moreover, the measure conflates those who do not live with either biological parent because of disadvantageous circumstances, such as orphanhood, with those who do not because of advantageous or otherwise neutral circumstances, such as obtaining employment or going to school in another city—although as noted above, those who are actually household heads or their spouses are eliminated altogether. Unfortunately, the data do not permit the construction of a measure of past family or household structure.

Other variables were considered for inclusion in the final models, but were too highly correlated with other covariates to include them or had other limitations. These included a variable indicating the type of area (rural/urban) in which the respondent grew up, which was highly correlated with household amenities. The number of community organizations in which the respondent participated—which previous research has found to be protective against early sexual activity and unprotected intercourse (Kaufman et al. 2002), could not be included because it was too highly correlated with current school enrollment—and would thus be missing for those who were not in school at the time of the survey.

III. RESULTS

A. DESCRIPTIVE RESULTS

Table 1 shows descriptive statistics among respondents in the stacked sample separately by sex. There are statistically significant differences between young women and young men in the sample on two of the three dependent variables. About one-third of the young women and young men in the sample are currently sexually active (31% and 38% respectively) and on average, the oldest partner for young women is nearly 3.5 years older than the respondent on average, while the oldest partner for young men is more than 2 years younger on average. Though it is not a statistically significant difference, 53 percent of young women report having unprotected sex with at least one recent partner during the previous month compared to 46 percent of young men.

Among the independent variables, there are statistically significant differences between young women and young men in the proportion who are at or above the expected grade for age and in family structure, with young women much more likely to be at or above expected grade (54% versus 39%) and slightly more likely to live with only one biological parent than the young men in the sample. Other statistics indicate that respondents are around 18 years old, have experienced a mean of 1 shock and that more than 60 percent have experienced at least one shock in the 24 months before the survey.

B. MULTIVARIATE RESULTS

Recall that the analyses for Approach 1 were conducted on the "stacked" data and include respondents in Groups 1, 2, and 3 and the analyses for Approach 2 were conducted on those in Group 2 only. Tables 2 and 3 include models for all three outcomes for female and male respondents respectively using the categorical shocks variable, while Tables 5 and 6 show these same models using the any shock variable. For each outcome in each table, Model 1 includes just the shocks variable to assess the gross association between household shocks and the outcome. Model 2 for each outcome adds the remaining individual and household covariates.

a. Approach 1

Current Sexual Activity. The first pair of columns in Tables 2 and 3 indicates that experiencing household shocks is not significantly associated with the odds of being sexually active in the previous month. Among females (Table 2), age is the only statistically significant predictor of sexual activity; as expected, each additional year of age increases the odds of being sexually active by 34 percent. Similarly for males (Table 3), each year of age is associated with a 39 percent increase in the odds of being sexually active. Family structure is also significantly associated with current sexual activity for males; young men living with both biological parents are 37 percent less likely to be sexually active than those living with neither parent.

Table 4 contains the models of current sexual activity among respondents who had had sex at least once. Notably, females experiencing two or more shocks are significantly less likely to be sexually active than those who did not experience any household shocks. Two points are notable here. First, this result may indicate that households respond to shocks by increasing the responsibilities of young women around the house, keeping them busier, more accountable, and perhaps under closer supervision of other household members, and perhaps leaving them with less time to engage in sexual activity. The size and direction of the coefficient for females experiencing one shock is consistent with this explanation, though the coefficient was not statistically significant. Second, the lack of statistical significance in the same model estimated for all female respondents (Table 2) suggests that once a young woman is sexually active, the decision to remain sexually active may be more open to influence compared to the decision to have sex for the first time for a woman who has never had sex.

The first pair of columns in Tables 5 and 6 shows that experiencing any household shock is not associated with being currently sexually active for either young women or young men. Again, age is associated with increased odds of being sexually active for both sexes and young men living with both biological parents are less likely to be sexually active than those living with neither parent.

Unprotected Sex. The second pair of columns in Tables 2, 3, 5, and 6 contains models estimating the odds of having unprotected sex in the previous month. As with the models of current sexual activity, none of the household shocks variables are significantly associated with unprotected sex. The only predictor that is significantly associated with having unprotected sex is household wealth; these results indicate that as household wealth increases, the odds of having unprotected sex decrease. For example, a one-unit increase in household wealth is associated with a 48 percent reduction in the odds of young women having unprotected sex (Table 2).

Age Difference with Recent Partners. The third pair of columns in Tables 2, 3, 5, and 6 contain models estimating the largest age difference between the respondent and his/her three most recent sexual partners. As with previous outcomes, household shocks are not associated with the magnitude of the age difference among young women. Household wealth is significantly positively associated with the size of the age difference; a one-unit increase in wealth is associated with a decrease in the age difference by 1.3 years (Table 2). This relationship remains in the models estimating the influence of any shock among young women (Table 5). This relationship is not significant for young men (Table 6).

b. Approach 2

Models in Approach 2 were conducted among respondents appearing in both survey waves. Tables 8 and 9 contain models (for females and males respectively) examining associations between the outcomes and a count of household shocks summed across waves while Tables 10 and 11 examine associations with experiencing any shock. In Table 8, Model 1 for unprotected sex indicates that young women experiencing three or more shocks have significantly greater odds of having unprotected sex compared to those who did not experience any shocks, and the coefficient is quite large (2.98). However, with the addition of other individual and household covariates in Model 2, the coefficient remains high but is no longer statistically significant. The household shocks variables in the other models are not significant. As in Approach 1, age is significantly positively associated with increased odds of sexual activity for both young women and young men. However, in contrast to models in Approach 1, age is not a statistically significant

predictor of partner age difference for young women. Among young men, however, age is significantly associated with partner age difference; a one-year increase in age is significantly associated with a decrease of .27 years in models including both the summed shocks and any shock variables (Tables 9 and 11). Finally, an increase in household wealth decreases the odds of having unprotected sex for both young women in models including the experience of any shock (Table 10) and young men (Table 11).

IV. DISCUSSION AND CONCLUSIONS

This analysis was guided by two research questions. First, are household shocks associated with being sexually active, having unprotected sex, or having sex with significant older partners? Second, are there cumulative effects of additional household shocks on these behaviors? Overall the results do not support the proposition that household shocks increase sexual activity, reduce condom use, or influence the age difference between young people and their sexual partner(s) or that there are cumulative effects. In light of the strong theoretical arguments and related empirical evidence suggesting that such associations exist, these results are somewhat surprising.

There are, however, a number of possible explanations for these findings, some of which are related to the limitations of this study. First, the list of household shocks included in the survey is unlikely to have captured the full range of potential disruption in young people's lives. Other disruptions in the household, such as the addition of a sibling, step-parent, step-sibling, or a member of the extended family, may also influence young people in ways that would increase their risky behavior, but these were not measured in the study. Moreover, while the household and family are important domains, important disruption may also occur in domains unmeasured by this survey—at school, with peers, in intimate relationships, at work. For example, being a victim of crime, a relatively common occurrence in South Africa (Burton et al. 2003), could induce respondents to seek comfort or reduce stress through risky sexual behavior. Future research should investigate this possibility, using qualitative methods that often elicit relevant contextual information or life history calendar methods that may identify other sources of disruption, perhaps including those not anticipated by the survey questions.

Relatedly, shocks with the biggest impact on young people's sexual behavior may not have been included in the list of shocks. For example, conflict within the household between a young person and his/her parent or among other members of the household may be a major influence on a young person's sexual behavior (Cherlin et al. 1991; Hetherington and Clingempeel 1992; Wu and Thomson 2001), but would not have been captured here. Previous research suggests that different types of disruption may influence different outcomes. Ram and Hou (2003), for example, found that declining economic resources helped to explain the relationship between family structure and cognitive outcomes but not emotional-behavioral outcomes, while deteriorating familial resources—especially ineffective parenting and parental depression—were more important in explaining emotional-behavioral outcomes. A study with a more inclusive list of disruptions in several domains would be useful for future research on this topic.

Moreover, it is difficult, if not impossible to completely disentangle the effects of household disruptions and the effects of persistent poverty or other risk factors on young people's sexual behavior. Poor households, for example, are significantly more likely to experience shocks in the first place (not shown) and may have a harder time "smoothing" a shock; a job loss would have a significant impact on a household with limited savings and few assets. Young people in poor households or single-parent households may have fewer emotional and financial resources to help them cope with household disruptions. I attempted to address these possibilities first by controlling for household wealth and family structure in the main analyses and examined the significance of interactions with household wealth (not shown). I also examined models stratified by quartiles of household wealth to investigate whether household shocks had an impact only when combined with a chronic negative condition like poverty; none of the coefficients for household shocks achieved statistical significance (not shown).

A related shortcoming is that the analysis does not account for resources available to help the young person or the household cope with the shocks and perhaps prevent or minimize risky sexual behavior. Resources like parental investment, access to extended family, as well as the young person's own self-esteem and mental health, may help him/her to cope

with stress of household contextual and economic shocks. Previous research has established associations between these and other resources and young people's sexual behaviors (Camlin and Snow (in press); Lee-Rife and Burgard 2008 (manuscript)).

Other resources, like ties with nearby households or extended family, may assist a household both logistically and financially smooth a shock. A neighbor may be available, for example, to supervise children if an additional job or increased working hours take the parent or other responsible adults in the household away from the household for long hours. A relative may provide similar logistical support, or may loan the household money to recover from the financial shock of a job loss. Indeed, research using the same data (Lee-Rife and Burgard 2008 (manuscript)) found significant positive associations between neighborhood concentrated disadvantage and social disorder and young women's hazard of sexual debut and odds of engaging in unprotected intercourse, as well as a significant negative association between neighborhood social cohesion and unprotected sex among young men. Other research has found similar effects in the US (Browning, Leventhal and Brooks-Gunn 2004; Browning, Leventhal and Brooks-Gunn 2005; Cubbin et al. 2005). The Durban survey did assess a limited number of these resources and characteristics, but unfortunately, the sample size is not large enough to explore them here in tandem with household shocks.

Another limitation may stem from the fact that the household shocks were reported by the household head or other adult rather than the young person him/herself. It is possible that the young adult was not aware of the shocks that were reported—parents may attempt to protect their children from negative conditions, and they may have succeeded in doing so, at least with certain shocks. Of course it would be difficult to disguise the death of a household resident or a significant financial loss, but other shocks reported here maybe easier3 to disguise—a job loss could be temporary, for example, and may be hidden from young people. Thus, a portion of the young people in this sample may not have experienced changes in their household context due to the shocks reported by the household head—and thus no change in behavior should be expected to result.

Another potential limitation of this analysis is that it equates the shocks with one another—a simple summing of the shocks means that a death in the household "counts" the same as the loss or destruction of household property and is thus implicitly assumed to have the same impact. However, while there **is** some research precedent to equating shocks in this way—Okun and colleagues (1994) note that numerous studies have found that count indexes like the one used here produce similar results as weighted indices—their impact may not be the same at all. A death may be much more influential on a young adult's emotional wellbeing—and thus, on their sexual behavior—than a parental job loss or even a residential move. Analysis estimating each shock separately (Appendix A, Tables 1-10) did indicate that a recent residential move increased the age difference between young men and their recent partner(s) by about half a year, but that other individual shocks were not significantly associated with sexual behaviors. Future research should investigate this possibility more carefully.

My analysis also treats the shocks included in the survey as uniformly negative experiences, but in reality, they may not be. A given shock may be positive for some individuals and negative for others. For example, a death in the household—of a parent or a beloved grandparent—may be a significant emotional and financial loss to one household, but a relief to another if the death occurred after a long illness that was difficult both emotionally and financially for the household to bear. Similarly, a shock may have both positive and negative consequences in the same household; the emotional cost of a death in a household might be high even though it may reduce the financial strain on the household by ending significant outlays for health care. Similarly, parental job loss may reduce available economic resources but may increase parental supervision because the parent no longer leaves the house to work. The ambiguity in the impact of different shocks may well have eliminated any apparent effects in the models included here. However, social stress theory suggests that even a desirable events may cause stress because they require adaptive or coping behavior (Boyle et al. 2008; Osborne and McLanahan 2007), so perhaps this ambiguity would not affect the results.

Furthermore, the shocks included in the present analysis do not capture changes in the family or household structure other than death. While household heads were asked about divorce or abandonment—the subject of much study in the US—other family or household structural changes may be much more relevant in this context, especially the immigration and out-migration of working-age adults due to the structure of the South African economy. Large numbers of non-White migrant laborers travel elsewhere in the country or the region for employment (Van Donk 2002). Their extended absences and returns may be an important disruption for young people.

In addition, the young people suffering the biggest impact from household shocks may not have been included in the sample or may have been lost to follow-up. One strategy that families may use to smooth economic shocks or address other poor conditions is to send young people in the household to live with relatives; this is a common practice in sub-Saharan Africa (Caldwell 1997). Alternatively the young people in a household suffering a shock or multiple shocks may be employed outside the home and not available for interview. Furthermore, a household that has suffered from multiple, serious shocks may have been dismantled or may have been absorbed into another household—with members moving in with others or taking up residence in an unofficial shack on the property of another relative, perhaps precluding their inclusion in the original sampling frame. Unfortunately, this limitation cannot be addressed with the available data.

A final limitation of this analysis is that I cannot determine whether the respondent lived in the household at the time that a given shock occurred or in the following period. South African adolescents are quite mobile, moving in and out of households of their parents and other relatives depending on economic circumstances, educational opportunities, and other household conditions (Bray 2003; Caldwell 1997; Madhavan 2004). Notably, households may respond to a given household shock by sending the young people in their households to live with relatives or elsewhere (Bray 2003). Consequently, the respondent may not have been exposed to a given household shock or the ensuing conditions in the household. Unfortunately, the data do not contain information on me to determine the extent of their exposure to the reported household shocks.

However, in spite of these limitations, this analysis provides an important "first step" in the analysis of household disruption on young people's sexual behavior. While the lack of significant findings is somewhat surprising given the strength of the theoretical foundation and related empirical research, the considerable data limitations may well have eliminated significant findings. Because there are so many possible reasons to explain the lack of association, additional attention to this topic is warranted in future research.

Table 2.1. Means and Percentages for Dependent and Independent Variables by Sex, Black Respondents (means or proportions, standard deviations in parentheses)

	Females	Males	Total	
Dependent Variables	Mean or %	Mean or %	Mean or %	p for diff.
Currently sexually active	30.75%	37.85%	33.92%	0.002
	(0.461)	(0.485)	(0.473)	
Unprotected sex with recent partners	53.12%	46.36%	49.77%	0.151
	(0.499)	(0.500)	(0.500)	
Largest age difference with recent partners	3.443	-2.047	0.908	0.000
	(3.838)	(2.029)	(4.502)	
Independent Variables				
Number of household shocks	1.032	1.011	1.029	0.646
	(1.011)	(1.008)	(1.010)	
Any household shock	65.04%	63.52%	64.36%	0.553
	(0.477)	(0.481)	(0.479)	
Age	17.97	17.95	18.02	0.897
	(2.684)	(2.642)	(2.665)	
At or above expected grade for age	53.61%	39.32%	47.29%	0.000
	(0.499)	(0.489)	(0.499)	
Household wealth	-0.154	-0.146	-0.154	0.753
	(0.591)	(0.625)	(0.606)	
Family structure				0.026
Neither biological parent	23.11%	25.07%	23.98%	
One biological parent only	42.64%	36.40%	39.87%	
Both biological parents	34.25%	38.53%	36.15%	
N	2710	2237	4947	

NOTES: All figures based on data weighted for complex survey design except column totals. P-values indicate results of tests for significant differences between males and females. Samples for unprotected intercourse are 803 females and 812 males and for largest mean age difference 926 females and 799 males.

Table 2.2 (Approach 1): Associations between categorical shocks and sexual behaviors for females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Categorical Shocks						
1 shock	1.059	0.969	0.882	0.718	-0.016	-0.121
	(0.170)	(0.184)	(0.254)	(0.197)	(0.586)	(0.520)
2+ shocks	0.869	0.747	1.263	1.021	0.298	0.189
	(0.131)	(0.127)	(0.324)	(0.262)	(0.455)	(0.480)
Age		1.336 ***		0.948		-0.312 *
		(0.044)		(0.050)		(0.131)
Household Wealth		0.854		0.517 **		-1.314 *
		(0.100)		(0.103)		(0.520)
At Grade for Age		0.739		0.818		0.460
		(0.127)		(0.203)		(0.472)
Family Structure						
Lives with one biological parent		1.215		1.172		0.568
		(0.217)		(0.289)		(0.585)
Lives with both biological parents		1.081		0.809		-0.288
		(0.188)		(0.207)		(0.481)
Constant					3.377 ***	9.113 ***
					(0.271)	(2.489)
F	0.782	20.156 ***	0.941	2.852 **	0.229	2.971 **
Degrees of freedom	(2, 1902)	(7, 1902)	(2, 670)	(7, 670)	(2, 578)	(7, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.3 (Approach 1): Associations between categorical shocks and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Categorical Shocks						
1 shock	0.906	0.949	1.270	1.234	-0.162	-0.048
	(0.153)	(0.170)	(0.361)	(0.354)	(0.209)	(0.183)
2+ shocks	1.059	1.072	1.175	1.135	-0.376	-0.241
	(0.181)	(0.210)	(0.332)	(0.336)	(0.254)	(0.199)
Age		1.387 ***		0.979		-0.421 ***
		(0.048)		(0.057)		(0.048)
Household Wealth		1.146		0.678 *		0.035
		(0.120)		(0.124)		(0.166)
At Grade for Age		1.014		0.827		-0.042
		(0.182)		(0.212)		(0.204)
Family Structure						
Lives with one biological parent		0.915		1.087		0.087
		(0.179)		(0.325)		(0.245)
Lives with both biological parents		0.632 *		1.074		-0.108
		(0.124)		(0.348)		(0.261)
Constant					-1.894 ***	6.290 ***
					(0.166)	(0.989)
F	0.395	19.295 ***	0.380	1.238	1.121	14.256 ***
Degrees of freedom	(2, 1583)	(7, 1583)	(2, 667)	(7, 667)	(2, 477)	(7, 477)
N	2237	2237	812	812	799	799

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.4 (Approach 1): Associations between categorical shocks and current sexual activity for respondents who have had sex (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Females			Males	
	Currently Sexually Active			Currently Sexually Active	
	M1	M2		M1	M2
Categorical Shocks					
1 shock	0.824	0.799		1.095	1.084
	(0.170)	(0.167)		(0.221)	(0.218)
2+ shocks	0.671	0.634	*	1.079	1.053
	(0.139)	(0.129)		(0.209)	(0.205)
Age		1.024			1.076
		(0.041)			(0.042)
Household Wealth		0.726	*		1.026
		(0.108)			(0.121)
At Grade for Age		0.788			0.766
		(0.156)			(0.143)
Family Structure					
Lives with one biological parent		1.062			0.900
		(0.211)			(0.179)
Lives with both biological parents		1.491			0.768
		(0.317)			(0.155)
F	1.871	2.358	*	0.121	1.622
Degrees of freedom	(2, 1131)	(7, 1131)		(2, 1073)	(7, 1073)
N	1504	1504		1437	1437

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.5 (Approach 1): Associations between any shock and sexual behaviors for females (coefficients for models on current sexual activity and unprotected sex are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Any Shock	0.977	0.874	1.010	0.819	0.104	-0.003
	(0.131)	(0.138)	(0.244)	(0.194)	(0.433)	(0.405)
Age		1.334 ***		0.952		-0.311 *
		(0.045)		(0.050)		(0.131)
Household Wealth		0.861		0.515 **		-1.317 *
		(0.101)		(0.104)		(0.516)
At Grade for Age		0.738		0.804		0.465
		(0.127)		(0.199)		(0.477)
Family Structure						
Lives with one biological parent		1.232		1.150		0.561
		(0.225)		(0.283)		(0.591)
Lives with both biological parents		1.093		0.796		-0.294
		(0.192)		(0.204)		(0.485)
Constant					3.377 ***	9.103 ***
					(0.271)	(2.498)
F	0.029	19.262 ***	0.002	2.809 *	0.058	2.809 *
Degrees of freedom	(1, 1902)	(6, 1902)	(1, 670)	(6, 670)	(1, 578)	(6, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.6 (Approach 1): Associations between any shock and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Any Shock	0.967	0.997	1.228	1.190	-0.250	-0.127
	(0.140)	(0.158)	(0.296)	(0.296)	(0.189)	(0.159)
Age		1.386 ***		0.979		-0.421 ***
		(0.048)		(0.057)		(0.048)
Household Wealth		1.144		0.677 *		0.024
		(0.120)		(0.124)		(0.164)
At Grade for Age		1.010		0.831		-0.029
		(0.182)		(0.213)		(0.207)
Family Structure						
Lives with one biological parent		0.909		1.091		0.078
		(0.180)		(0.330)		(0.247)
Lives with both biological parents		0.629 *		1.072		-0.106
		(0.123)		(0.348)		(0.258)
Constant					-1.894 ***	6.288 ***
					(0.166)	(0.988)
F	0.054	22.642 ***	0.725	1.431	1.759	16.740 ***
Degrees of freedom	(1, 1583)	(6, 1583)	(1, 667)	(6, 667)	(1, 477)	(6, 477)
N	2237	2237	812	812	799	799

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.7 (Approach 1): Associations between any shock and current sexual activity among respondents who have had sex (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Females Currently Sexually Active			Males Currently Sexually Active	
	M1	M2		M1	M2
Any Shock	0.758	0.729		1.088	1.070
	(0.133)	(0.129)		(0.187)	(0.183)
Age		1.022			1.076
		(0.042)			(0.042)
Household Wealth		0.731	*		1.026
		(0.109)			(0.121)
At Grade for Age		0.789			0.767
		(0.157)			(0.143)
Family Structure					
Lives with one biological parent		1.079			0.900
		(0.218)			(0.180)
Lives with both biological parents		1.509			0.768
		(0.324)			(0.155)
F	2.475	2.461	*	0.241	1.890
Degrees of freedom	(1, 1131)	(6, 1131)		(1, 1073)	(6, 1073)
N	1504	1504		1437	1437

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.8 (Approach 2): Associations between summed categorical shocks (1999 & 2001) and sexual behaviors among females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Categorical Shocks (1999 & 2001)						
1 shocks	1.361	1.196	0.942	0.797	-0.240	-0.188
	(0.453)	(0.408)	(0.500)	(0.391)	(0.765)	(0.625)
2 shocks	0.948	0.776	1.110	0.714	0.358	0.129
	(0.288)	(0.247)	(0.523)	(0.339)	(0.494)	(0.519)
3+ shocks	1.078	0.882	2.982 *	2.188	0.369	0.225
	(0.330)	(0.284)	(1.395)	(1.008)	(0.470)	(0.505)
Age		1.271 ***		1.082		-0.047
		(0.057)		(0.075)		(0.095)
Household Wealth		0.963		0.415 **		-0.911 *
		(0.172)		(0.126)		(0.387)
At Grade for Age		0.651		0.838		0.422
		(0.155)		(0.300)		(0.479)
Family Structure						
Lives with one biological parent		0.820		0.742		-0.445
		(0.195)		(0.276)		(0.675)
Lives with both biological parents		0.863		1.341		-0.977
		(0.252)		(0.584)		(0.785)
Constant					1.565 ***	2.873
					(0.316)	(1.856)
F	0.574	5.598 ***	3.582 *	2.688 **	0.398	1.129
Degrees of freedom	(3, 852)	(8, 852)	(3, 307)	(8, 307)	(3, 377)	(8, 377)
N	853	853	308	308	378	378

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.9 (Approach 2): Associations between summed categorical shocks (1999 & 2001) and sexual behaviors among males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Categorical Shocks (1999 & 2001)						
1 shocks	0.653	0.645	2.257	2.179	0.265	0.219
	(0.217)	(0.242)	(1.210)	(1.129)	(0.436)	(0.372)
2 shocks	0.678	0.652	1.928	1.782	0.538	0.514
	(0.225)	(0.232)	(1.062)	(0.979)	(0.461)	(0.384)
3+ shocks	0.754	0.700	2.529	2.132	0.251	0.396
	(0.234)	(0.237)	(1.281)	(1.075)	(0.448)	(0.371)
Age		1.292 ***		1.062		-0.272 ***
		(0.059)		(0.074)		(0.063)
Household Wealth		0.977		0.619		0.078
		(0.165)		(0.153)		(0.184)
At Grade for Age		1.073		0.657		0.315
		(0.268)		(0.227)		(0.251)
Family Structure						
Lives with one biological parent		0.889		1.040		0.217
		(0.251)		(0.382)		(0.281)
Lives with both biological parents		0.643		0.903		-0.065
		(0.200)		(0.365)		(0.304)
Constant					-3.627 ***	1.809
					(0.381)	(1.444)
F	0.637	4.833 ***	1.156	1.658	0.507	7.023 ***
Degrees of freedom	(3, 702)	(8, 702)	(3, 330)	(8, 330)	(3, 337)	(8, 337)
N	703	703	331	331	338	338

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.10 (Approach 2): Associations between summed categorical shocks (1999 & 2001) and current sexual activity among female and males who have ever had sex (coefficients are exponentiated; standard errors are in parentheses)

	Females		Males	
	Currently Sexually Active		Currently Sexually Active	
	M1	M2	M1	M2
Categorical Shocks (1999 & 2001)				
1 shocks	1.306	1.105	0.646	0.618
	(0.505)	(0.423)	(0.258)	(0.256)
2 shocks	0.802	0.647	0.623	0.564
	(0.287)	(0.231)	(0.239)	(0.219)
3+ shocks	0.927	0.765	0.727	0.632
	(0.340)	(0.280)	(0.270)	(0.237)
Age		1.071		1.132 *
		(0.053)		(0.058)
Household Wealth		0.917		0.922
		(0.187)		(0.178)
At Grade for Age		0.582 *		0.782
		(0.151)		(0.210)
Family Structure				
Lives with one biological parent		0.771		0.885
		(0.197)		(0.270)
Lives with both biological parents		1.015		0.729
		(0.322)		(0.247)
F	0.814	1.769	0.567	1.597
Degrees of freedom	(3, 595)	(8, 595)	(3, 574)	(8, 574)
N	596	596	575	575

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.11 (Approach 2): Associations between any shock (1999 or 2001) and sexual behaviors among females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Any shock (1999 or 2001)	1.118	0.947	1.451	1.080	0.165	0.052
	(0.305)	(0.269)	(0.619)	(0.444)	(0.430)	(0.397)
Age		1.270 ***		1.065		-0.052
		(0.058)		(0.070)		(0.100)
Household Wealth		1.020		0.408 **		-0.953 *
		(0.184)		(0.127)		(0.391)
At Grade for Age		0.654		0.775		0.393
		(0.156)		(0.285)		(0.465)
Family Structure						
Lives with one biological parent		0.810		0.846		-0.418
		(0.195)		(0.300)		(0.697)
Lives with both biological parents		0.853		1.342		-0.985
		(0.253)		(0.594)		(0.779)
Constant					1.565 ***	2.962
					(0.316)	(1.950)
F	0.169	6.857 ***	0.762	2.254 *	0.146	1.339
Degrees of freedom	(1, 852)	(6, 852)	(1, 307)	(6, 307)	(1, 377)	(6, 377)
N	853	853	308	308	378	378

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.12 (Approach 2): Associations between any shock (1999 or 2001) and sexual behaviors among males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Any shock (1999 or 2001)	0.694	0.664	2.221	2.014	0.350	0.367
	(0.194)	(0.211)	(1.051)	(0.937)	(0.406)	(0.333)
Age		1.292 ***		1.062		-0.273 ***
		(0.059)		(0.074)		(0.063)
Household Wealth		0.973		0.615 *		0.082
		(0.165)		(0.150)		(0.188)
At Grade for Age		1.069		0.662		0.273
		(0.272)		(0.229)		(0.267)
Family Structure						
Lives with one biological parent		0.889		1.032		0.239
		(0.254)		(0.380)		(0.292)
Lives with both biological parents		0.638		0.894		-0.073
		(0.197)		(0.369)		(0.312)
Constant					-3.627 ***	1.853
					(0.381)	(1.441)
F	1.703	6.476 ***	2.843	2.150 *	0.746	7.975 ***
Degrees of freedom	(1, 702)	(6, 702)	(1, 330)	(6, 330)	(1, 337)	(6, 337)
N	703	703	331	331	338	338

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.13 (Approach 2): Associations between any shock (1999 or 2001) and current sexual activity among female and males who have ever had sex (coefficients are exponentiated; standard errors are in parentheses)

	Females		Males	
	Currently Sexually Active		Currently Sexually Active	
	M1	M2	M1	M2
Any shock (1999 or 2001)	0.987	0.829	0.662	0.602
	(0.321)	(0.269)	(0.224)	(0.211)
Age		1.071		1.133 *
		(0.054)		(0.058)
Household Wealth		0.994		0.919
		(0.206)		(0.179)
At Grade for Age		0.581 *		0.788
		(0.152)		(0.215)
Family Structure				
Lives with one biological parent		0.746		0.874
		(0.194)		(0.271)
Lives with both biological parents		0.989		0.724
		(0.316)		(0.245)
F	0.002	1.747	1.490	2.087
Degrees of freedom	(1, 595)	(6, 595)	(1, 574)	(6, 574)
N	596	596	575	575

Note: Models are weighted to account for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A1 (Approach 1): Associations between death in the household and sexual behaviors for females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Death	0.996	0.939	1.047	0.928	-0.036	-0.064
	(0.139)	(0.158)	(0.255)	(0.229)	(0.472)	(0.527)
Age		1.333 ***		0.954		-0.311 *
		(0.044)		(0.050)		(0.128)
Household Wealth		0.867		0.525 **		-1.316 *
		(0.100)		(0.105)		(0.521)
At Grade for Age		0.741		0.812		0.458
		(0.129)		(0.203)		(0.514)
Family Structure						
Lives with one biological parent		1.237		1.154		0.565
		(0.225)		(0.284)		(0.598)
Lives with both biological parents		1.105		0.810		-0.298
		(0.196)		(0.208)		(0.469)
Constant					3.453 ***	9.120 ***
					(0.354)	(2.651)
F	0.001	19.934 ***	0.036	2.616 *	0.006	2.234 *
Degrees of freedom	(1, 1902)	(6, 1902)	(1, 670)	(6, 670)	(1, 578)	(6, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A2 (Approach 1): Associations between illness or injury in the household and sexual behaviors for females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Illness/Injury	0.862	0.753	1.216	1.081	0.658	0.641
	(0.142)	(0.152)	(0.343)	(0.308)	(0.584)	(0.591)
Age		1.336 ***		0.954		-0.322 *
		(0.045)		(0.051)		(0.126)
Household Wealth		0.858		0.528 **		-1.261 *
		(0.099)		(0.107)		(0.543)
At Grade for Age		0.737		0.819		0.457
		(0.127)		(0.204)		(0.470)
Family Structure						
Lives with one biological parent		1.254		1.157		0.560
		(0.225)		(0.284)		(0.585)
Lives with both biological parents		1.109		0.821		-0.311
		(0.192)		(0.210)		(0.459)
Constant					3.314 ***	9.198 ***
					(0.311)	(2.551)
F	0.810	20.391 ***	0.481	2.655 *	1.272	2.760 *
Degrees of freedom	(1, 1902)	(6, 1902)	(1, 670)	(6, 670)	(1, 578)	(6, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A3 (Approach 1): Associations between job loss in the household and sexual behaviors for females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Job Loss	1.055	0.968	0.995	0.981	-0.786	-0.842
	(0.170)	(0.180)	(0.248)	(0.239)	(0.468)	(0.454)
Age		1.333 ***		0.955		-0.306 *
		(0.044)		(0.050)		(0.127)
Household Wealth		0.867		0.525 **		-1.358 *
		(0.101)		(0.105)		(0.537)
At Grade for Age		0.744		0.819		0.427
		(0.128)		(0.202)		(0.479)
Family Structure						
Lives with one biological parent		1.239		1.160		0.568
		(0.226)		(0.286)		(0.579)
Lives with both biological parents		1.114		0.821		-0.282
		(0.195)		(0.210)		(0.461)
Constant					3.560 ***	9.123 ***
					(0.302)	(2.585)
F	0.109	20.191 ***	0.000	2.636 *	2.823	2.314 *
Degrees of freedom	(1, 1902)	(6, 1902)	(1, 670)	(6, 670)	(1, 578)	(6, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A4 (Approach 1): Associations between theft, fire, or burglary of household property and sexual behaviors for females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Theft	0.766	0.714	1.030	0.975	-0.132	-0.049
	(0.135)	(0.139)	(0.303)	(0.297)	(0.470)	(0.439)
Age		1.334 ***		0.955		-0.311 *
		(0.044)		(0.050)		(0.128)
Household Wealth		0.866		0.524 **		-1.318 *
		(0.100)		(0.105)		(0.531)
At Grade for Age		0.738		0.818		0.465
		(0.127)		(0.202)		(0.480)
Family Structure						
Lives with one biological parent		1.230		1.159		0.560
		(0.222)		(0.284)		(0.580)
Lives with both biological parents		1.120		0.820		-0.294
		(0.197)		(0.210)		(0.465)
Constant					3.461 ***	9.101 ***
					(0.313)	(2.585)
F	2.276	22.803 ***	0.010	2.596 *	0.079	2.245 *
Degrees of freedom	(1, 1902)	(6, 1902)	(1, 670)	(6, 670)	(1, 578)	(6, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A5 (Approach 1): Associations between household residential move and sexual behaviors for females (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Residential Move	0.882	0.950	1.190	1.027	0.757	0.557
	(0.174)	(0.231)	(0.403)	(0.340)	(1.103)	(1.073)
Age		1.333 ***		0.955		-0.304 **
		(0.044)		(0.049)		(0.117)
Household Wealth		0.867		0.525 **		-1.320 *
		(0.100)		(0.105)		(0.526)
At Grade for Age		0.746		0.820		0.449
		(0.130)		(0.203)		(0.497)
Family Structure						
Lives with one biological parent		1.230		1.162		0.637
		(0.236)		(0.290)		(0.687)
Lives with both biological parents		1.102		0.824		-0.172
		(0.202)		(0.213)		(0.545)
Constant					3.307 ***	8.787 ***
					(0.233)	(2.145)
F	0.405	19.779 ***	0.264	2.640 *	0.471	3.400 **
Degrees of freedom	(1, 1902)	(6, 1902)	(1, 670)	(6, 670)	(1, 578)	(6, 578)
N	2710	2710	803	803	926	926

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A6 (Approach 1): Associations between death in the household and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active			Unprotected Sex			Partner Age Difference		
	M1	M2		M1	M2		M1	M2	
Death	1.187	1.214		0.995	0.985		-0.360	-0.307	
	(0.192)	(0.232)		(0.267)	(0.271)		(0.217)	(0.173)	
Age		1.389	***		0.980			-0.422	***
		(0.047)			(0.056)			(0.048)	
Household Wealth		1.155			0.671	*		0.027	
		(0.123)			(0.124)			(0.165)	
At Grade for Age		1.018			0.830			-0.049	
		(0.183)			(0.211)			(0.207)	
Family Structure									
Lives with one biological parent		0.916			1.093			0.097	
		(0.182)			(0.329)			(0.246)	
Lives with both biological parents		0.640	*		1.065			-0.123	
		(0.125)			(0.342)			(0.258)	
Constant							-1.947	*** 6.315	***
							(0.118)	(0.977)	
F	1.117	24.594	***	0.000	1.317		2.753	18.704	***
Degrees of freedom	(1, 1583)	(6, 1583)		(1, 667)	(6, 667)		(1, 477)	(6, 477)	
N	2237	2237		812	812		799	799	

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A7 (Approach 1): Associations between illness or injury in the household and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active			Unprotected Sex			Partner Age Difference		
	M1	M2		M1	M2		M1	M2	
Illness/Injury	0.953	0.983		1.089	1.010		-0.270	-0.348	
	(0.160)	(0.182)		(0.297)	(0.274)		(0.230)	(0.191)	
Age		1.386	***		0.981			-0.426	***
		(0.048)			(0.057)			(0.048)	
Household Wealth		1.143			0.672	*		0.020	
		(0.121)			(0.123)			(0.164)	
At Grade for Age		1.010			0.831			-0.056	
		(0.181)			(0.213)			(0.204)	
Family Structure									
Lives with one biological parent		0.909			1.095			0.066	
		(0.179)			(0.327)			(0.249)	
Lives with both biological parents		0.628	*		1.068			-0.119	
		(0.122)			(0.338)			(0.259)	
Constant							-1.994	*** 6.395	***
							(0.122)	(0.972)	
F	0.081	21.720	***	0.097	1.329		1.382	17.314	***
Degrees of freedom	(1, 1583)	(6, 1583)		(1, 667)	(6, 667)		(1, 477)	(6, 477)	
N	2237	2237		812	812		799	799	

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A8 (Approach 1): Associations between job loss in the household and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active			Unprotected Sex			Partner Age Difference		
	M1	M2		M1	M2		M1	M2	
Job Loss	1.172	1.198		1.452	1.398		-0.375	-0.079	
	(0.186)	(0.213)		(0.404)	(0.408)		(0.244)	(0.206)	
Age		1.386	***		0.973			-0.420	***
		(0.048)			(0.058)			(0.048)	
Household Wealth		1.161			0.685	*		0.026	
		(0.123)			(0.127)			(0.164)	
At Grade for Age		1.005			0.829			-0.017	
		(0.181)			(0.213)			(0.207)	
Family Structure									
Lives with one biological parent		0.904			1.090			0.092	
		(0.180)			(0.336)			(0.248)	
Lives with both biological parents		0.626	*		1.056			-0.092	
		(0.121)			(0.343)			(0.257)	
Constant							-1.972	6.196	***
							(0.121)	(0.981)	
F	0.997	22.068	***	1.797	1.365		2.356	16.672	***
Degrees of freedom	(1, 1583)	(6, 1583)		(1, 667)	(6, 667)		(1, 477)	(6, 477)	
N	2237	2237		812	812		799	799	

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A9 (Approach 1): Associations between theft, fire, or burglary of household property and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active		Unprotected Sex		Partner Age Difference	
	M1	M2	M1	M2	M1	M2
Theft	1.139	1.018	1.024	1.059	-0.357	-0.078
	(0.210)	(0.183)	(0.305)	(0.311)	(0.263)	(0.223)
Age		1.386 ***		0.980		-0.421 ***
		(0.048)		(0.056)		(0.048)
Household Wealth		1.144		0.669 *		0.034
		(0.120)		(0.121)		(0.162)
At Grade for Age		1.011		0.834		-0.025
		(0.181)		(0.209)		(0.203)
Family Structure						
Lives with one biological parent		0.909		1.089		0.081
		(0.180)		(0.321)		(0.249)
Lives with both biological parents		0.628 *		1.064		-0.102
		(0.122)		(0.336)		(0.259)
Constant					-1.988 ***	6.217 ***
					(0.122)	(0.982)
F	0.500	21.847 ***	0.006	1.343	1.842	16.639 ***
Degrees of freedom	(1, 1583)	(6, 1583)	(1, 667)	(6, 667)	(1, 477)	(6, 477)
N	2237	2237	812	812	799	799

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 2.A10 (Approach 1): Associations between household residential move and sexual behaviors for males (coefficients for models on current sexual activity and unprotected intercourse are exponentiated; standard errors are in parentheses)

	Currently Sexually Active			Unprotected Sex			Partner Age Difference				
	M1	M2		M1	M2		M1		M2		
Residential Move	0.898	1.053		0.708	0.705		0.881	**	0.576	*	
	(0.214)	(0.289)		(0.268)	(0.282)		(0.314)		(0.266)		
Age		1.387	***		0.975				-0.415	***	
		(0.048)			(0.055)				(0.048)		
Household Wealth		1.143			0.670	*			0.020		
		(0.120)			(0.125)				(0.161)		
At Grade for Age		1.011			0.832				-0.065		
		(0.182)			(0.209)				(0.209)		
Family Structure											
Lives with one biological parent		0.912			1.055				0.146		
		(0.180)			(0.314)				(0.251)		
Lives with both biological parents		0.631	*		1.041				-0.051		
		(0.123)			(0.334)				(0.257)		
Constant							-2.154	***	5.989	***	
							(0.117)		(0.992)		
F	0.205	22.132	***	0.835	1.305		7.877	**	17.741	***	
Degrees of freedom	(1, 1583)	(6, 1583)		(1, 667)	(6, 667)		(1, 477)		(6, 477)		
N	2237	2237		812	812		799		799		

Note: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

CHAPTER 3

THE LINK BETWEEN SEXUAL VICTIMIZATION AND ADOLESCENT PREGNANCY RECONSIDERED: A ROBUST TEST IN THE SOUTH AFRICAN CONTEXT

I. INTRODUCTION

South Africa is characterized by high levels of both sexual victimization[3] and adolescent pregnancy[4] (Republic of South Africa 1998; Wood and Jewkes 1998). While a cross-disciplinary group of researchers has produced considerable work on the relationship between these two phenomena, drawing conclusions about the relationship between them is difficult because of the significant methodological limitations of previous work. Past studies have not addressed the issue of right-censoring, to ascertain the temporal ordering of the pregnancy relative to the victimization, or to control for potentially confounding variables, and many have relied on small or otherwise selective samples (Adams and East 1999; Boyer and Fine 1992; Butler and Burton 1990; Chandy, Blum and Resnick 1996; Fergusson, Horwood and Lynskey 1997; Fiscella et al. 1998; Jewkes et al. 2001b; Nagy, DiClemente and Adcock 1995; Rainey, Stevens-Simon and Kaplan 1995; Silverman et al. 2001; Smith 1996; Stock et al. 1997; Zierler et al. 1991).

Moreover, most of the previous work on this topic has been conducted in the United States, with its unique socio-cultural context and norms about adolescent pregnancy and sexual victimization. Although neither adolescent pregnancy nor sexual victimization are

[3] I use the term sexual victimization to refer to any activity of a sexual nature in which an individual of any age is unwilling, or any such activity occurring between someone younger than age 13 and someone 5 or more years older. Activity of a sexual nature can include fondling or unwanted touching, indecent exposure, oral sex, attempted rape, actual rape, and other similar activities.

[4] Adolescence is defined here as ages 10-19 in keeping with the definition used by the World Health Organization (2007).

uncommon in the United States (Raghavan et al. 2004; US Department of Health and Human Services 2000), both are non-normative and generally discouraged by mainstream society. However, because the link between the two phenomena has not been examined outside of the United States, we cannot know if the theories that have been used or developed to explain the purported link apply only to that context or if they are more widely applicable cross-culturally. South Africa offers a particularly interesting context in which to examine this link because of widespread cultural acceptance for adolescent fertility there and different norms pertaining to violence and coercion in intimate relationships (Preston-Whyte et al. 1990; Richter 1996; Wood, Maepa and Jewkes 1997).

This article addresses some of the limitations of previous work on this topic. Using data from a large, regionally-representative survey of South African girls and young women, I use hazard modeling techniques to calculate a more accurate hazard of adolescent pregnancy for girls and young women who were willing participants in their first intercourse and those who experienced some degree of coercion or force. The large population-based probability sample and the range of background variables available in the data also allow me to gain statistical power over previous work and to control for potentially confounding factors. As a result of these and other methodological improvements, this article provides a more robust test of the link between sexual victimization and adolescent pregnancy than has been offered by previous work. Furthermore, I test the association in South Africa, a society more generally accepting of adolescent pregnancy and with different norms concerning the appropriateness of violence and coercion in relationships. This test in another context may help to clarify the ways in which sexual victimization exerts (or does not exert) its influence on fertility behavior and strengthen the theories used to explain the association.

II. BACKGROUND AND SIGNIFICANCE

C. LINKS BETWEEN SEXUAL VICTIMIZATION AND ADOLESCENT PREGNANCY

There are both theoretical and empirical reasons to expect that experiencing sexual victimization would increase the risk of becoming pregnant during adolescence. At least part of this association can be explained by the fact that nonconsensual intercourse is likely to be unprotected intercourse; a woman being forced to have intercourse is unlikely to be able to negotiate condom use or another form of contraception. Indeed, one study (Holmes et al. 1996) found that in the United States, 6 percent of rape victims became pregnant as the direct result of rape. To my knowledge, no comparable study has been conducted in South Africa, but the figures are likely to be similar.

A number of indirect pathways have also been suggested to explain the link between the two phenomena; these explanations are not mutually exclusive and may work in tandem. Some suggest, for example, that the trauma of sexual victimization during childhood or adolescence may interfere with normal progress through developmental stages, preventing victims from developing sound decision-making abilities and making them more likely to engage in sexual behaviors that increase their risk of pregnancy (Boyer and Fine 1992). Alternatively, the negative psychosocial consequences of experiencing coercive sexual contact, such as lowered self-esteem or self-efficacy, may make survivors more vulnerable to sexual advances and more inclined to seek comfort or validation in sexual relationships (Briere and Elliott 1994; Butler and Burton 1990; Gage 1998; Luster and Small 1997b). In addition, sexual victimization may provide an inappropriate model of sexual behavior or may socialize survivors to believe that their self-worth depends on fulfilling the sexual needs of others, which increases the likelihood of engaging in risky sexual behavior and a resulting pregnancy (Browning and Laumann 1997; Butler and Burton 1990; Herman-Giddens et al. 1998). And finally, survivors may unconsciously seek out opportunities to repeat and master the situations that left them vulnerable in the past, in this case by engaging in sexual activity, with a consequent increase in the risk of pregnancy (Horowitz 1986). In short, sexual victimization may increase the risk of an

adolescent pregnancy by increasing subsequent sexual activity and perhaps by influencing decision-making about contraceptive use.

Empirically, there is some evidence of a link between sexual victimization and subsequent sexual behaviors (see review by Putnam 2003), although the results are inconsistent. For example, a number of studies have found that experiencing unwanted sexual contact increased the risk of early sexual debut (Berenson, Wiemann and McCombs 2001; Fiscella et al. 1998; Silverman et al. 2001; Stock et al. 1997) and several have shown that sexually victimized females are more likely to have multiple sexual partners (Stock et al. 1997; Whitmire et al. 1999). In addition, Stock and colleagues (1997) found that unwanted sexual contact reduces the likelihood of contraceptive use during subsequent intercourse. However, another study (Widom and Kuhns 1996) did not find an association between unwanted sexual contact and the number of sexual partners or contraceptive use.

The studies that have tested the **direct** relationship between sexual victimization and adolescent pregnancy have also produced mixed results. The majority of studies find a significant association between the two phenomena, notably including the one study in South Africa, the setting of present study (e.g., Chandy, Blum and Resnick 1996; Jewkes et al. 2001; Kenney, Reinholtz and Angelini 1997; Nagy, DiClemente and Adcock 1995; Romans, Martin and Morris 1997; Silverman et al. 2001; Zierler et al. 1991), some find no association at all (Adams and East 1999; Herman-Giddens et al. 1998; Smith 1996; Widom and Kuhns 1996), and some find an association only through mediating variables like sexual precocity (Roosa et al. 1997; Stock et al. 1997).

It is unclear whether the mixed results produced by these studies are due to variation in the definitions of sexual victimization used and how much is due to real differences between groups. Silverman and colleagues (2001), for example, defined sexual victimized respondents as those who had “ever been raped or forced to have sex by a date,” while two other studies defined a respondent as sexually victimized if someone had touched her in a place that she did not want to be touched or did something to her sexually that she did not want (Nagy, DiClemente and Adcock 1995; Stock et al. 1997).

Furthermore, at least one study found an association with adolescent pregnancy only among those experiencing the most severe forms of sexual victimization—rape, not among those experiencing less severe forms of victimization, such as coercion or attempted rape (Kenney, Reinholtz and Angelini 1997). There appears to be no systematic variation in findings depending on the definition of sexual victimization used in the study; thus previous research does not provide clear guidance on how to define sexual victimization for the purposes of this study.

D. THE LIMITATIONS OF PREVIOUS RESEARCH

However, in spite of the considerable number of studies examining the link between sexual victimization and adolescent pregnancy, significant methodological limitations make it difficult to draw conclusions about the nature of their relationship. Limitations including the failure or inability to address the issue of right-censoring or to determine the correct temporal ordering of variables, the use of very small and otherwise selective samples, and the lack of attention to potentially confounding characteristics undermine the validity of these findings, limit their generalizability, and call into question the causal influence of sexual victimization on adolescent pregnancy. While a complete review of the literature is beyond the scope of this paper, some of the most fundamental flaws are detailed below.

Right-Censoring. A number of the existing studies on this topic have not addressed the issue of right-censoring in their analysis (Adams and East 1999; Fergusson, Horwood and Lynskey 1997; Jewkes et al. 2001; Nagy, DiClemente and Adcock 1995; Rainey, Stevens-Simon and Kaplan 1995; Silverman et al. 2001; Smith 1996; Stock et al. 1997; Zierler et al. 1991). That is, many studies have examined the risk of adolescent pregnancy among respondents who are still adolescents, and who could still go on to have an adolescent pregnancy after the survey. Failing to account for this possibility in the analysis can lead to a significant underestimation of the overall risk of adolescent pregnancy and can thus lead to erroneous conclusions about the relationship between the two phenomena.

Temporal Ordering. Furthermore, a surprising number of studies have failed to ascertain that the respondent's coercive sexual experience actually preceded the adolescent pregnancy, undermining claims of a causal relationship between the two phenomena (Adams and East 1999; Butler and Burton 1990; Chandy, Blum and Resnick 1996; Nagy, DiClemente and Adcock 1995; Rainey, Stevens-Simon and Kaplan 1995; Saewyc, Magee and Pettingell 2004; Silverman et al. 2001; Stock et al. 1997). While cross-sectional studies are common in social science and public health research and can provide important information about the relationships between variables, the conclusions that can be drawn from them must be tempered if temporal ordering cannot be ascertained. However, few authors have noted this limitation or attempted to address it in their studies.

Sample Selectivity. Many studies on this topic have been conducted on small sample sizes and convenience samples, such as from family planning clinics, antenatal clinics, or classrooms (Adams and East 1999; Boyer and Fine 1992; Butler and Burton 1990; Jewkes et al. 2001; Zierler et al. 1991). While these small studies have been useful in generating hypotheses, the sampling procedures may introduce considerable selectivity into the sample and also preclude generalization to larger populations. Other smaller studies have additional limitations, such as a lack of racial or socioeconomic diversity (Blinn-Pike et al. 2002; Stock et al. 1997), which raise other questions about the validity of their results. Since numerous studies have demonstrated variation in the consequences of sexual victimization—and even in its prevalence—by race and socioeconomic status in the United States (e.g., Fiscella et al. 1998; Roosa et al. 1997) and South Africa (Reddy et al. 2003; Rutenberg et al. 2001), this is an important additional limitation.

Confounding Variables. Most studies on the topic have also failed to control for potentially confounding variables, like socioeconomic status, family structure, and education, which may be associated with the phenomena, undermining the validity of their findings (Boyer and Fine 1992; Chandy, Blum and Resnick 1996; Gershenson et al. 1989; Kenney, Reinholtz and Angelini 1997; Nagy, DiClemente and Adcock 1995; Stock et al. 1997; Zierler et al. 1991).

Sampling on the Dependent Variable. Two frequently cited studies sample on the dependent variable—that is, they sample among pregnant or parenting adolescents or those who were pregnant or parenting during adolescence and compare their experience with sexual victimization to findings from national studies (Boyer and Fine 1992; Butler and Burton 1990). Both studies find that pregnant and parenting adolescents have much higher rates of sexual victimization than non-pregnant/parenting adolescents in the national studies and conclude that sexual victimization is a risk factor for adolescent pregnancy. However, national averages can mask significant subgroup variation and such comparisons do not control for other characteristics, such as family structure or economic deprivation, which might differ between the study population and the group from which the national estimates were calculated. Without controlling for such differences, there is no way of knowing whether the differences in prevalence are due to differences in these other characteristics or whether sexually victimized individuals are really more likely to become pregnant during adolescence.

Because of these methodological limitations, further testing of the relationship between sexual victimization and adolescent pregnancy is warranted. This paper examines the link between one form of sexual victimization—that is, involuntary first intercourse—and adolescent pregnancy, testing whether girls are more likely to get pregnant during adolescence if they were unwilling participants in their first intercourse than if they were willing. Using data from a large survey of South African young people, I address a number of the methodological shortcomings of previous work and provide a more robust test of the link between these two phenomena.

E. WHY IS ADOLESCENT PREGNANCY IMPORTANT?

Pregnancy and childbearing during adolescence—defined here ages 10-19 in keeping with the definition used by the World Health Organization and other researchers on adolescence (Mensch, Bruce and Greene 1998; World Health Organization 2007)—is of particular concern to policymakers, program developers, and parents because it is associated with a wide range of disadvantages for the adolescents and their children, especially in sub-Saharan Africa. These disadvantages include higher risk of maternal

morbidity and mortality, increased stillbirth and miscarriage, reduced educational and employment prospects, and an increased risk of poverty (El Gibaly and Lee-Rife 2004; Hofferth, Reid and Mott 2001; Hoffman 1998; Kulin 1988; Nash 1990; Preston-Whyte et al. 1990; Singh 1998; Zabin and Kiragu 1998). While recent studies in South Africa have demonstrated that adolescent pregnancy does not necessarily confer health risks (Ncayiyana and ter Haar 1989) or educational disadvantage (Marteleto, Lam and Ranchhod 2006) to adolescent mothers, these few studies contradict a large body of research suggesting there may be cause for concern.

There has been considerable debate about the nature of the relationship between adolescent pregnancy and childbearing and negative social and economic disadvantage (Geronimus and Korenman 1992; Geronimus, Korenman and Hillemeier 1994; Hoffman 1996; Hoffman 1998; Hoffman, Foster and Furstenberg 1992). Some argue for a causal relationship, that is, that adolescent pregnancy/childbearing causes the subsequent observed social and economic disadvantages while others argue that the direction of causation is reversed—that social and economic disadvantage increases the likelihood of adolescent pregnancy and childbearing. Still others argue that both adolescent pregnancy/childbearing and social and economic disadvantage in adulthood are caused by a third factor, such as childhood poverty, poor decision-making skills, inability to delay gratification, and the like. The debate highlights the importance of this issue—and for this reason, and others, my research examines adolescent pregnancy.

First, adolescence and young adulthood are developmentally critical life stages (Jessor 1998; Jessor, Turbin and Costa 1998a; Jessor, Turbin and Costa 1998b). They are times of preparation for adult roles—productive, reproductive, social, and civic. Decisions made during these life stages can have significant implications for the future and interference with this preparation can constrain ones' acquisition of human and social capital, with clear social and economic consequences (Lerner and Galambos 1998). While there is considerable social support for South African girls who become pregnant or have children during adolescence, which may lessen or minimize any disadvantage(s) conferred on them, childbearing may well add challenges to the transition to adulthood.

I also address adolescent pregnancy in this study because studies in both the United States and South Africa have demonstrated that the majority of pregnancies to adolescents are unplanned and a good portion of those are mistimed, if not actually unwanted by the adolescent girls themselves (Finer and Henshaw 2006; Manzini 2001; Rutenberg et al. 2001; Varga and Makubalo 1996; and unpublished tabulations from the 1998 South Africa Demographic and Health Survey). This data, coupled with the considerable disadvantages that adolescent pregnancy and childbearing **may** confer, suggest that understanding more about the factors that increase their risk may help to improve the well-being of adolescent girls and their children. Furthermore, the South African government continues its efforts to reduce the incidence of adolescent pregnancy and childbearing; this effort is one of the main priorities of the country's adolescent reproductive health program (Dickson-Tetteh and Ladha 2000; Ministry of Welfare and Population Development 1998). Research on factors that may increase the risk of adolescent pregnancy will help to target these prevention efforts more precisely.

Finally, adolescent pregnancy reflects a pattern of behavior (i.e., unprotected intercourse) that also puts young people and their children at risk of HIV infection. In South Africa, where researchers estimate that up to one-third of young people are infected with HIV (Gilbert and Walker 2002), such behavior can have life-threatening consequences. Thus research on the risk factors for adolescent pregnancy may also help to identify those at increased risk of HIV infection.

For these reasons, research to determine the factors that increase the risk of adolescent pregnancy is particularly salient to efforts to improve the life chances of adolescent girls and young women.

F. THE SOUTH AFRICAN CONTEXT

South Africa provides an interesting context in which to test this relationship because of the prevalence of sexual victimization and adolescent pregnancy, and because of dominant gender roles, the place violence has come to play in its society, and the role that fertility plays in South African women's identity. As noted above, South Africa has very

high levels of both sexual victimization and adolescent pregnancy. According to one report, South Africa has the highest level of reported rape in the world (Rape Crisis Cape Town n.d.) and other types of unwanted or coercive sexual contact are also common (Wood and Jewkes 1998). Sexual victimization is particularly common among adolescent girls in South Africa and the prevalence may in fact be increasing (Hirschowitz, Worku and Orkin 2000; Republic of South Africa 1998). Nationally- and provincially-representative surveys have found that up to one-third of adolescent girls experienced a forced or coerced sexual debut and up to 60 percent have ever experienced violence (sexual or non-sexual) inflicted by an intimate partner (Baleta 1999; CIETAfrica 2001; Jewkes and Penn-Kekana 2002; Republic of South Africa 1998).[5] Furthermore, more than 35 percent of South African women were pregnant before the age of 20 and more than 30 percent have given birth at least once by then (Republic of South Africa 1998); particularly high levels of adolescent pregnancy are found among Black and Coloured women.[6] The high levels of each phenomenon there suggest that investigating an association between the two is both necessary and profoundly important.

Studying this issue in South Africa is also of utmost importance because violence and coercion of all sorts appears to have been somewhat normalized in relationships between South African men and women (Jewkes et al. 1999; Wood, Maforah and Jewkes 1998). South African gender norms—particularly among Blacks and within some tribes—encourage males to assert their masculinity and dominance over women by initiating sex at an early age, having multiple partners, and by using violence to punish assertive or successful women and girls for deviating from prescribed gender norms (Leclerc-Madlala

[5] The prevalence of sexual victimization in South Africa may actually be even higher. Women may not report experiencing sexual coercion to legal authorities or in surveys because they fear recriminations or because they feel ashamed or do not wish to speak badly about their husband (Heise et al. 1994). Furthermore, because many women in South Africa, as elsewhere, have been socialized to accept physical and emotional abuse as a husband's or partner's right, women may not identify violent behaviors as abusive (Fischbach and Herbert 1997). Indeed, between one-third and one-half of women in one study who had had recent experiences of physical and sexual coercion did not describe themselves as abused (Jewkes et al. 1999). Consequently, these prevalence estimates should be considered the minimum levels of sexual coercion occurring in South Africa.

[6] Under the apartheid system (1948-1994), South Africans were officially assigned to one of four population groups: Black/African, Coloured, Asian, or White. Although apartheid ended in 1994, I use the same labels here because the legacy of population group-based policies persists; these categories still index groups' relative rankings within the social structure and often connote cultural distinctions (Kaufman and Stavrou 2002).

1997; Zabin and Kiragu 1998). Furthermore, many in South Africa believe that males have a biologically-based need for sex and a right to engage in it when and how they want and with whomever they choose; denying these urges is considered to be both impossible and unhealthy. These norms also give them the right to use violence against a female who refuses to have sex or tries to negotiate the terms of intercourse (Jewkes et al. 1999; Jewkes et al. 2001; Leclerc-Madlala 1997; Maman et al. 2000; Penn-Kekana 1997; Preston-Whyte 1999; Varga 1999; Vetten and Bhana 2001). Most respondents in one study (Wood, Maforah and Jewkes 1998), for example, felt that coercion and violence are "an inevitable part of all relationships" or an "expression of love" between men and women.

Moreover, the country's long history of violence associated with the apartheid regime, which until 1994 controlled every aspect of the lives of non-whites and enforced rule violations with violence and death, may have normalized violence in all aspects of society. Because violent behavior in South Africa is socially constructed as appropriate in many cases (Jewkes et al. 2001), it is plausible that the consequences of sexual victimization may not be identical in type or magnitude to those observed in the West. However, even normative sexual victimization may produce negative consequences. Several qualitative studies in South Africa note that women fear violence from their partners if they refuse sex or attempt to end the relationship, and often remain in a partnership or accede to intercourse to avoid violence (Jewkes et al. 2001; Varga 1999). Such descriptions suggest that while not unexpected in intimate interactions between South African men and women, violence is still problematic and likely influences their behavior in some way.

And finally, the importance of fertility in South African culture, its central place in both men's and women's identity, and cultural acceptance of adolescent fertility may serve to dampen a potential association between sexual victimization and adolescent pregnancy in the sample studied here. The cultural importance of female fertility has been widely cited as a primary explanation for the high pregnancy rates among South African adolescents and young women (Caldwell and Caldwell 1993; Preston-Whyte 1988; Preston-Whyte

and Zondi 1992; Varga 2003). The widespread acceptance of adolescent childbearing in South Africa, especially among Blacks (Makiwane 1998)—the focus of this analysis, may lessen the purported negative consequences and reduce the disincentives to adolescent childbearing. For example, family members are frequently available to provide childcare and the children of adolescent mothers are usually absorbed into the mother's (or grandmother's) household and given the protection of her ancestors (Jewkes et al. 2001; Tanga and Uys 1996), and girls are unlikely to be forced into marriage when they become pregnant (Gage 1998). Furthermore, unlike many developing countries, girls in South Africa are not forbidden from returning to school after giving birth and many in fact do (Jewkes et al. 2001; Kaufman, de Wet and Stadler 2000; Marteleto, Lam and Ranchhod 2006). In addition, many Black adolescents are encouraged to become pregnant by their partners and grandmothers (Preston-Whyte et al. 1990; Richter 1996; Wood, Maepa and Jewkes 1997) and some are told by their mothers that pregnancy during adolescence is far preferable to the prospect of infertility caused by contraceptive use (Wood, Maepa and Jewkes 1997). Without a great deal of stigma attached to adolescent pregnancy and childbearing, these events may be more welcome prospects across the board and may not be more likely to occur as a consequence of sexual victimization. Further and stronger empirical analysis is needed to expand our understanding of the relationship between sexual victimization and adolescent pregnancy.

This analysis focuses on Black/African girls and young women, in part because the small numbers of respondents from other racial or "population" groups in the available data make meaningful analysis of other groups impossible. However, there are important substantive reasons to focus on this group as well. First, Blacks/Africans are the largest and most disadvantaged population group in South Africa; the vast majority are poor and live in communities with poor infrastructure and services (Statistics South Africa 2007) and low average levels of socioeconomic resources (Treiman, McKeever and Fodor 1996). As a result, young Black women may have more stressors and fewer resources with which to cope with the experience of sexual victimization than members of population groups (Gerard and Buehler 2004; Jessor, Turbin and Costa 1998a; Jessor, Turbin and Costa 1998b). Second, young Black South Africans comprise the vast

majority of adolescents and young adults in the country. Since young people under age 24 comprise almost 30 percent of the population (Population Reference Bureau 2006) and about four out of five young people are Black, what happens to this group will have significant consequences for the rest of the country. This is particularly true with respect to fertility, given the long-term consequences of early childbearing for the structure of a population. And finally, Black youth are most severely affected by the country's HIV epidemic—one survey estimates that 12.3 percent of Blacks aged 15-24 are infected with HIV, compared to just 1.7 percent of Coloureds and less than 1 percent of Whites and Asians (Shisana et al. 2005)—and these cohorts bear the brunt of new infections, in South Africa and worldwide (UNAIDS 1999). Since adolescent pregnancy is also a marker of unprotected intercourse, understanding the many influences on young people's sexual behavior may help to slow the HIV epidemic.

III. THE PRESENT STUDY

In this analysis, I examine whether experiencing sexual victimization at one's first intercourse is associated with having an adolescent pregnancy. While ideally I would examine whether **any** experience of sexual victimization influences adolescent fertility behavior, the available data do not allow the timing of other experiences of sexual victimization relative to pregnancy.

As noted above, the present study addresses many of the shortcomings of previous work on this issue. While it cannot address all of the methodological issues described above, it corrects for two main limitations. First, the data used are from a large, regionally-representative survey of adolescents and young adults that randomly selected individuals to participate. This yields a sample that is large enough to give statistical power and that is generalizable to larger populations. Second, event history methods are used for the analysis, which addresses the right-censoring problem by using person-years rather than individuals as units of analysis and allowing censored individuals to contribute correctly to the estimated hazard of adolescent pregnancy. Third, the range of background

variables available in the data allows the control of potentially confounding variables that previous research has established as predictive of adolescent pregnancy and of sexual victimization. The data, sample, and methods are described in further detail below.

G. DATA AND SAMPLE

This analysis is based on data from girls and young women in a large, regionally-representative panel survey of young people in South Africa, the Transitions to Adulthood in the Context of AIDS study (hereafter, the Durban study). The Durban study was conducted on an initial sample of approximately 3,100 young people ages 14-24 in two districts within KwaZulu-Natal Province, Durban Metro and Mtunzini Magisterial District (Rutenberg et al. 2001). A modified stratified, multi-stage cluster sampling method was used with census enumeration areas from the 1996 Census serving as the primary sampling unit. The first wave of interviews was conducted in 1999 with all willing young people aged 14–24 years within each census enumeration area. Both the young person and the household head were re-interviewed in 2001, and a new group of adolescents—a replacement sample from the same sampling frame—was added in 2001 and first interviewed at that time. Female respondents who were in either or both waves of the survey are included in the sample, and thus range in age from 14 to 27. If the respondent was in both survey waves, her records are joined together to create a continuous record from her first intercourse to the time of the second interview.

The sample is restricted to respondents who report that they had had sexual intercourse by age 20, because respondents were only asked about their experiences with involuntary sexual intercourse if they indicated that they had ever had sex and because those who had not had sex before age 20 were not at risk of an adolescent pregnancy. As noted above, the sample is further restricted to include only Black respondents, as there were not enough respondents of other population groups to conduct meaningful analysis. The 37 respondents who reported that they were the heads of households or the spouses of household heads were excluded because of the potential endogeneity of their status in the household and their pregnancy history. That is, a respondent who got pregnant during adolescence may have moved out of her natal home to form a separate household (with or

without her partner) because of her pregnancy. After excluding respondents who do not have complete information available for all of the covariates, the final sample includes 1,044 Black girls and young women.

H. METHODS

I use Cox proportional hazards models to evaluate differences in the hazards of experiencing an adolescent pregnancy by respondents' experiences during their first sexual intercourse. The Cox proportional hazards model is a semi-parametric model that makes no assumptions about the form (shape) of the baseline hazard; the model is semi-parametric because while the baseline hazard can take any form, the covariates enter the model parametrically (e.g., linearly). It is specified as follows:

$$h_i(t) = h_o(t) \exp(ß_1X_{i1} + ß_2X_{i2} + ß_3X_{i3} \ldots + \beta_kX_{ik})$$

where:
i is a subscript for observation
$X_{(1, 2, 3, \ldots k)}$ are the independent covariates for a given observation *i*
$h_i(t)$ is the hazard function at time t
and $h_0(t)$ is the baseline hazard or the hazard for an individual when the value of all the independent covariates equal zero.

The covariates, $X_1, \ldots, X_k$ are assumed to act multiplicatively on h(t). The Cox proportional regression model assumes that the effects of the predictor variables are constant over time. The assumption of hazard proportionality indicates that changes in levels of the independent variables will produce proportionate changes in the hazard function, independent of time. Thus, for fixed-time covariates, the exponentiated form of a coefficient describes the relative change in the baseline hazard due to that covariate.

Sample weights are used in all analyses to account for the complex sampling design and sample retention. If a respondent is present in two waves of the survey, the weight from the most recent wave of data is used in the analysis; this is standard practice in statistical analysis of panel data because it uses the most current information about the sample.

I. MEASURES

1. Dependent Variable

The dependent variable is the hazard of having a pregnancy before age 20. The risk exposure period begins at the reported age of first intercourse and ends at the age of first reported pregnancy or at age 20 (i.e., the end of the 19th year of age). Because of the difficulty in determining when an individual would return to being at risk of pregnancy after a pregnancy or birth and because only a small number of respondents had more than one adolescent pregnancy, respondents are considered no longer in the risk set at the time of their first pregnancy before age 20. Right-censored cases include respondents who did not become pregnant during adolescence and respondents who were less than age 20 at the last interview. Because the statistical software used in this analysis automatically excluded respondents whose age at first intercourse equaled their age at first pregnancy, I made a small adjustment in the age of first pregnancy—adding 0.5 years—for these respondents under the assumption that on average, these respondents contributed one-half year to the hazard calculations.

2. Independent Variable

Survey participants were asked the following question concerning their first intercourse: "Thinking about first time you had sexual intercourse, could you tell me which statement best describes your experience?" and given five possible responses, including "I was willing," "I was persuaded," "I was tricked," "I was forced", and "I was raped." A range of interpretations is possible from these responses. A persuaded respondent, for example, could have been initially unwilling but became convinced by her partner so that by the time intercourse occurred, she was a willing participant. Alternatively, she could have been initially unwilling but did not feel she could refuse; in other words, she acceded to intercourse under duress. A third possibility is that a young woman might indicate that she was persuaded rather than willing to save face in front of an interviewer, since many societies have a taboo about young women appearing interested in or eager for sex. Since I cannot adjudicate between these and other plausible interpretations, and considering that the responses themselves appear to indicate vastly different experiences, I analyzed the

responses separately using a simple four-category variable rather than grouping them into one variable indicating "sexually victimized" or not. However, because of the small numbers of respondents in the forced and raped categories, I collapsed those categories into one, similar to analysis conducted by Jewkes and her colleagues (Jewkes et al. 2001). Collapsing the two categories requires the assumption that intercourse involving physical force would have the same consequences regardless of the assailant. This is not ideal but is necessary to obtain enough statistical power to conduct the analysis.

3. Control variables

I included a number of variables in the models to control for other potential sources of variation. If more than one observation of these variables was available—as would occur if a respondent appeared in both waves of the survey, I used the observation closest to her age of first intercourse to ensure that it best reflects the circumstances that may have influenced her fertility behavior.

Education. I control for the respondents' education level because previous research has found strong negative correlations between educational achievement and involvement in sexual risk-taking behaviors related to increased pregnancy risk, such as earlier sexual debut and reduced condom use (Dryfoos 1996; Green et al. 2000; Hallman 2004; Jessor, Turbin and Costa 1998; Kaufman et al. 2002; Kirby 1999). For respondents who were below age 18 at the time of their sexual debut, I measure education with a variable indicating whether or not she was at or above the expected grade level for her age (*1 = Yes*) during the year *before* her first intercourse, that is, the year before she enters the risk set, because of the potential endogeneity of measuring education at older ages.[7] Because relatively few Black South Africans attain more than a secondary education, I determine the educational level of those respondents who were ages 18 and 19 at the time of their first intercourse by measuring whether they had achieved 12 years of education by age

[7] Other variables, such as poverty, may explain both a respondent's low educational achievement and higher risk of experiencing sexual victimization. Moreover, a girl might be more likely to drop out of school if she were sexually abused by a teacher (unfortunately not uncommon in South Africa) (Human Rights Watch 2001) and also might be more likely to drop out of school if she experiences a pregnancy.

18; if they had, they would have been at or above the expected grade for their age at that time.

Household socioeconomic status. Because other studies have found a negative association between socioeconomic status and sexual risk-taking behaviors related to pregnancy risk (Hallman 2005; Hallman and Grant 2004), I control for household socioeconomic status. It is measured with an index of amenities in the household, including materials used to construct the roof and walls of the home, the type of toilet facilities and water supply, access to electricity, the number of rooms in the household per person, ownership of the home, the use of paraffin for cooking, and ownership of a working, non-cellular telephone. This index was created using the "alpha" command in Stata 8.0, which computes the interitem correlations for all pairs of variables and produces a Cronbach's alpha statistic to evaluate the scale formed from these variables. The Cronbach's alpha value for this index is 0.73 and the range is -1.99 to 0.813. Unfortunately, a lack of comparability between the two survey waves precluded the use of other measures of household socioeconomic status.[8]

Family structure. Because previous research has found family structure to be associated with a wide range of sexual behaviors (Browning, Leventhal and Brooks-Gunn 2004; Dallimore 2000 (unpublished); Dinkelman, Lam and Leibbrandt 2007; Hallman 2004; Wu and Thomson 2001), I also control for it in the analysis. It is measured with a three-category variable to indicate whether the respondent lived with both biological parents, with only one biological parent, or with neither biological parent. Unfortunately, sample size did not permit separating those living with one biological parent into those living with either their mother or their father. This measure is not ideal, as it is measured after the age of first intercourse and for some respondents, after the pregnancy in question occurred; thus family structure cannot be considered part of the "causal chain" of adolescent pregnancy unless this family structure remained constant between first intercourse and the time of the survey. Moreover, the measure conflates those who do not

[8] The household questionnaire used in Wave 1 also included a series of questions about household monthly expenditures on food and non-food items, but these were not asked in Wave 2. Conversely, the questionnaire used in Wave 2 contained a series of questions about assets owned by the household, such as televisions, gas/electric stoves, automobiles, and the like, but these questions were not asked in Wave 1.

live with either biological parent because of disadvantageous circumstances, such as orphanhood, with those who do not because of advantageous or otherwise neutral circumstances, such as obtaining employment or going to school in another city—although as noted above, those who are actually household heads or their spouses are eliminated altogether. Unfortunately, the data do not permit the construction of a measure of past family or household structure.

I examined levels of association among the control variables to ensure that multicollinearity was not a problem. The correlations among the continuous variables were minimal and insignificant and there were no strong relationships among any of the categorical variables (analysis not shown).

J. ANALYSIS PLAN

I first estimate the difference in hazards in a model without control variables to ascertain gross differences between groups. Second, I estimate a model including the other individual and household covariates to examine whether differences in the hazard of adolescent pregnancy persist (Table 3). Because preliminary analysis indicated that tricked respondents had a unique response pattern compared to the forced/raped group, I also estimated models comparing those two groups directly (Table 4).

I also estimated models comparing each of the other respondent categories to the willing respondents (e.g., forced/raped versus willing; tricked versus willing; and so on) to determine whether the control variables operated differently for the separate groups (Table 5).

One limitation of this analysis is that it only considers the respondent's experience during her first intercourse. Since the risk of unwanted intercourse increases with age and the prevalence of sexual victimization is so high in South Africa, many respondents who willingly had sex for the first time probably went on to experience unwanted intercourse at a later time. Thus there may not be a meaningful distinction between those who were willing participants in their first intercourse and those who were not. Unfortunately,

although the survey did ask respondents who were willing at first intercourse if they had ever experienced forced intercourse, they did not ascertain **when** these events may have occurred; thus I could not ascertain the temporal ordering of the forced intercourse relative to any pregnancy. Nevertheless, I attempted to determine whether this limitation of the data influenced the results by excluding the 73 respondents who were not forced or raped at their debut but who experienced forced intercourse at some later time and replicating the analysis shown in Table 3 (Table 6).[9,10,11]

IV. RESULTS

K. DESCRIPTIVE RESULTS

Table 1 shows the distribution of respondents by their description of first intercourse. Notably, less than half of the respondents described themselves as willing participants in their first intercourse, and more than 30 percent described themselves as persuaded. Table 2 presents descriptive information for measures used in the analysis by description of first intercourse. Most notably, more than 68 percent of forced/raped respondents and 69 percent of tricked respondents got pregnant before age 20 compared to 44 percent of respondents who were willing; statistical tests indicate a significant difference among groups for this variable. Note that all of these figures are considerably higher than the 35 percent found in the South Africa Demographic and Health Survey (Republic of South Africa 1998). Statistical tests also indicate a significant difference among the groups in mean current age. Furthermore, willing respondents have a slightly higher mean level of

[9] Note that these respondents are not strictly comparable to those who were forced or raped at first sex because the former responded to a slightly different question: "Have you ever had sexual intercourse when somebody was physically forcing you, hurting you, or threatening you?"

[10] I also estimated models adding the control variables one at time to determine whether any control variables were particularly influential in the results. The analyses show remarkable stability in the size and significance of the exponentiated coefficients, so are not addressed further in the text (Table A1).

[11] After running the analysis, I created "log-log" plots to determine whether the data support the main assumption of Cox proportional hazards models, that the hazards of the different groups of respondents are proportional to each other over time. These graphs plot the estimated cumulative hazard over time for each group and are adjusted for the other covariates in the model. The roughly parallel curves for each group and the lack of crossover among the lines indicate that the assumption of proportional hazards is supported by the data.

household wealth than the other groups, but difference among groups are not statistically significant.

L. MULTIVARIATE RESULTS

Table 3 shows the results of models estimated using a four-category independent variable for the description of first intercourse; the willing category is the reference group or omitted category. Coefficients have been exponentiated for ease of interpretation. Unexpectedly, those who were tricked into their first intercourse are more than two times more likely to have an adolescent pregnancy than respondents who were willing participants in their first intercourse (the reference group), while the hazards for the other groups are not statistically significant. Household wealth is the only control variable to achieve significance in the full model; a one-unit increase in the household wealth index is associated with about a 20 percent reduction in the hazard of adolescent pregnancy.

Models comparing the tricked respondents directly to the forced/raped respondents (Table 4) provides further evidence of the uniqueness of the tricked respondents; net of individual and household controls, forced/raped respondents have a 45 percent lower hazard of adolescent pregnancy than the tricked respondents. In the full model here, respondent's educational attainment is statistically significant. Respondents who were at or above the expected grade for their age during the year before their sexual debut are 43 percent less likely to get pregnant before age 20 than those who are below the expected grade for age. Other control variables are not significant.

The models shown in Table 5 compare the willing respondents to each of the other response groups, the persuaded, tricked, and forced/raped, to investigate whether the control variables operate differently for each group. Persuaded respondents have an 8 percent higher hazard of pregnancy before age 20 for every additional year of age. Notably, this is the only group for whom age is statistically significant. Among the forced/raped respondents, a one-unit increase in household wealth reduces their hazard of adolescent pregnancy by 27 percent. None of the control variables are significant for the tricked respondents.

The models shown in Table 6 replicate the models in Table 3 for the sample that excludes the 73 respondents who were not forced/raped at first intercourse but experienced forced intercourse at some later time to address the issue of potential "blurring" between the groups described in Section III, part D. The results for these models are quite similar to the initial models in size and significance levels. Tricked respondents had a significantly higher hazard of adolescent pregnancy than willing or persuaded respondents, but the hazard for other groups are not significantly different from the hazard of the willing respondents. Household wealth is a statistically significant predictor of adolescent pregnancy in all of the multivariate models and retains almost the same magnitude as it had in the initial models; a one-unit increase in the household wealth index is associated with about a 21 percent reduction in the hazard of adolescent pregnancy.

V. DISCUSSION AND CONCLUSIONS

The purpose of this analysis was to provide a more robust test of the association between sexual victimization and adolescent pregnancy using data from young women in South Africa. The results provide some support for an association between sexual victimization at first intercourse and a higher hazard of adolescent pregnancy, although surprisingly, those who experienced the most severe forms of sexual victimization—forced sex and rape—did not differ significantly from willing participants in their hazard. The only statistically significant association was found for tricked respondents, whose hazard of adolescent pregnancy was 209 percent higher than the hazard for those who were willing. In light of previous research indicating that more severe forms of sexual victimization, like rape, have greater consequences than less severe forms (e.g., Boney-McCoy and Finkelhor 1995; Romans, Martin and Morris 1997), one might expect that the consequences for adolescent pregnancy would be more evident—or at least **as** evident—among those who were forced or raped as they are among those who were tricked. However, my results do not follow this expectation.

My results provide mixed support for the findings of previous studies on the topic. Those studies that either investigated only the most severe forms of victimization (i.e., rape or forced sex) or that included a wide range of unwanted sexual experiences in the definition of sexual victimization but did not distinguish between different degrees of victimization have mostly found a significant positive association between victimization and adolescent pregnancy (Nagy, DiClemente and Adcock 1995; Silverman et al. 2001). My findings concerning the tricked respondents corroborate these other studies; tricked respondents have a significantly higher hazard of adolescent pregnancy than willing respondents. However, the insignificant findings for forced/raped respondents in the Durban sample do not. Those studies that distinguished among different degrees of sexual victimization—including the one study on this topic conducted in South Africa—have generally found that only respondents experiencing the most severe forms of victimization are more likely to get pregnant during adolescence; those who were less severely victimized did not have a significantly higher risk (Jewkes et al. 2001b; Kenney, Reinholtz and Angelini 1997). To the extent that being tricked is a less severe form of sexual victimization than forced sex or rape, my results directly contradict these studies. Forced or raped respondents in the Durban sample are not statistically different from willing respondents in their hazard of adolescent pregnancy, but tricked respondents are.

There are a number of possible explanations for this mixed support. Because my analysis addresses many of the methodological shortcomings of previous studies, it may have produced a more correct estimate of the hazard of adolescent pregnancy for all respondents. In light of the relative strength of the methodological foundation, these findings provide evidence that the relationship between sexual victimization and adolescent pregnancy is not as straightforward as previous research has suggested.

I can speculate that the significance of the pregnancy hazard for tricked respondents and the lack of significance of the hazard of those who were forced/raped may stem from differences in the interactions between the respondents and their partners before and during the intercourse in question. That is, forced/raped respondents likely experienced some level of physical force or threat of force and may have felt they had little control

over the situation. Thus perhaps they felt less personal responsibility for the events that transpired. Consequently, they may not have been compelled to repeat and master the situation that left them vulnerable, as some scholars have suggested (Browning and Laumann 1997). Rather, the trauma of their first intercourse may have encouraged them to withdraw from or reduce their sexual activity, consistent with other research that has found sexually victimized individuals may avoid sexual intimacy (Cherlin et al. 2004; Fergusson, Horwood and Lynskey 1997; Jackson et al. 1990; Polusny and Follette 1995) and have difficulty forming intimate relationships. Conversely, tricked respondents may have felt they "should have known better" or that they somehow contributed to the events even though they were not precisely willing participants. This increased sense of personal responsibility may have increased their compulsion to repeat and master the event—that is, intercourse—that left them vulnerable in the past, increasing their sexual activity and yielding a higher pregnancy hazard. Unfortunately, the Durban data do not contain information on the proportion of the time before age 20 that the respondent was sexually active—a limitation that extends to other research on the topic—nor do they contain information on psychosocial variables, so there is no way to probe this issue further here. Future research should gather more information in order to attend to this possibility. Theories explaining the link between sexual victimization and adolescent pregnancy may need to be updated to accommodate a wider variation in individual response.

Alternatively, the different associations found in this analysis compared to other studies on the topic may be explained, at least in part, by differences in the context between South Africa and the US, where most of the studies on this topic have been conducted. As noted above, strong acceptance of—and even support for—adolescent fertility in South Africa may mute differences in the fertility behavior of victimized and non-victimized respondents that are observed in US-focused studies. This could explain why forced/raped respondents in this analysis are no more likely to become pregnant during adolescence than their willing counterparts. However, if the inconsistent results do stem from differences between the US and South African contexts, the statistical significance of the tricked respondents' hazard remains puzzling, unless the relationship would have been larger in the absence of this cultural support. The latter finding makes it clear,

however, that social acceptance of adolescent fertility in South Africa is **not** so powerful that it swamps **any** influence that sexual victimization may have on adolescent fertility. Nevertheless, if the link between sexual victimization and adolescent pregnancy **is** offset or diminished by greater social acceptance of adolescent pregnancy, the importance of examining the broader context surrounding adolescent sexual activity and sexual victimization becomes readily apparent. As noted above, most theories linking sexual victimization and adolescent pregnancy operate through individual-level psychological changes—impaired decision-making ability, lowered self-esteem, and the compulsion to repeat and master traumatic situations (Briere and Elliott 1994; Browning and Laumann 1997; Butler and Burton 1990; Herman-Giddens et al. 1998; Horowitz 1986; Luster and Small 1997b). Increased attention to the surrounding context in future studies of these two phenomena may help to shed light on important mediating or moderating factors.

These mixed findings, then, leave some questions unanswered. Is sexual victimization so normalized in South Africa that it exerts no influence on those who are victimized? Does the widespread cultural acceptance of—and even encouragement of—adolescent fertility mute differences in adolescent fertility between victimized and willing respondents? My results preclude simple conclusions. More research is needed on the context surrounding the sexual victimization experience and on a range of possible consequences so we can understand if, when, and **how** the experience of sexual victimization exerts an influence on victims. This echoes recommendations from other work on "best practices" for conducting research on sexual victimization and its consequences (Ellsberg et al. 2001; see Hamby and Koss (2003) for a closer examination of this literature).

What do these findings say about gender roles in South Africa? The frequency with which the girls and young women in this sample described themselves as persuaded into their first intercourse reveals that traditional gender scripts—norms dictating that girls and young women should not be too interested in having sex and that they should be pursued by potential male partners—are still current in relationships among young Black South Africans. As noted above, there are many different interpretations of the "persuaded" response, but each is consistent with these traditional norms. That is,

persuaded respondents may have been initially reluctant to have intercourse but became convinced in response to their partners' cajoling and pleading or ultimately acceded under duress. Similarly, persuaded respondents may have actually been willing but represented themselves to survey interviewers as persuaded—that is, as not completely willing—to maintain the fiction of male-as-pursuer and female-as-pursued. Each possible interpretation suggests that many respondents have internalized these norms and enact them, consciously or unconsciously, in their interactions with the opposite sex and with survey interviewers. Furthermore, the high prevalence of sexual victimization and in particular the prevalence of respondents describing themselves as tricked, forced, or raped demonstrate that norms encouraging or permitting men to assert their masculinity by coercing or forcing women to have sex are alive and well (Jewkes et al. 1999; Jewkes et al. 2001b), or at least that they were in 1999 and 2001 when the survey was conducted. It is clear that the male partners of these respondents either feel they have an exclusive right to determine the terms of intercourse or that they are expected to do so and behave accordingly.

The high level of adolescent pregnancy provides additional commentary on current South African gender roles and can be viewed in at least three ways. First, the high prevalence of adolescent pregnancy among both willing and sexually victimized respondents confirms the social importance of fertility in South Africa and its central place in women's—and perhaps men's—identity. Second, it suggests that, in the face of considerable socioeconomic disadvantage and few prospects for completing advanced education, finding employment, or establishing an independent household, young Black South Africans may see childbearing as a means to gain adult status. Furthermore, childbearing may allow girls and young women to access economic resources—in the form of support from a child's father or from the state-sponsored Child Welfare Grant—that they might not otherwise have. Third, the high prevalence of adolescent pregnancy may simply be evidence of the relative immaturity of adolescent girls and their limited ability to plan ahead or fully anticipate the consequences of their actions. Other research has found that for many adolescent girls, sexual intercourse "just happens," without intention or plan (Jewkes et al. 2001b; Martin 1996); the same may be true for pregnancy

during adolescence. The acceptance of adolescent fertility in South Africa may further support this as there are few incentives to prevent pregnancy in such a setting.

Finally, the high levels of adolescent pregnancy indicate high levels of unprotected sex among the girls and young women in this sample and a large number of infants at risk of HIV infection during birth and breastfeeding. Other research has noted the conundrum faced by women in settings with high HIV prevalence between protecting oneself from HIV infection and achieving fertility goals (Preston-Whyte 1999; Rutenberg et al. 2002). Especially given the importance of fertility in much of South African culture, these results make it clear that HIV prevention efforts that target only condom use and abstinence may not meet the needs of women and men in this population.

Limitations of This Study. Limitations in the data and structure of the survey questionnaire create four main limitations of this analysis and have important implications for future research. First, as noted above, this analysis focuses only on the respondent's first experience with intercourse because it is the only episode of sexual victimization that can be timed relative to a respondent's pregnancy. This is an unfortunate limitation, both because the risk of sexual victimization increases with age but also because sexual revictimization is not uncommon (Cherlin et al. 2003; Dunkle et al. 2004). Although I conducted additional analysis to determine if this limitation distorted my findings—and found similar results after eliminating those who had subsequently been forced or raped, additional information about the timing of life events would make my estimates of the influence of sexual victimization on the hazard of adolescent pregnancy more precise.

Second, this analysis included only Black/African respondents from the survey because of the small number of respondents from the other population groups in South Africa. As noted above, there are important reasons to investigate this dynamic exclusively among the Black population, including the fact that Blacks are the largest and most disadvantaged population group in South Africa. Moreover, recent research suggests that South Africa is experiencing increasing within-group inequality in the post-apartheid era; policies put in place since the end of apartheid to improve the wellbeing of non-Whites

have increased within-group disparities as some individuals have been able to take advantage of new opportunities while others have been unable (Adato, Carter and May 2006; Moll 1998). Nevertheless, future surveys should seek oversample respondents from other population groups to allow for a more complete analysis of this and other topics in the South African context.

Third, the question used to ascertain the respondents' experience with sexual victimization was preceded by a series of questions that began with the questions "Have you ever had sexual intercourse?" and "If so, how old were you when you first had sex?" Then, only after a series of questions about partner characteristics was the respondent asked to describe herself during her first sexual experience, as willing, persuaded, and so on. Clearly the survey designers assumed that respondents who had been raped, forced, or persuaded to have intercourse would consider the episode a **sexual** experience and count the perpetrator of that experience as a sexual partner. However, respondents may not classify an experience with unwanted intercourse as their **sexual** debut because the incident was coercive or violent, not sexual. Framing the questions this way, the survey may not have captured the experiences of individuals who were sexually victimized preceding their first "sexual" intercourse and may have blurred the distinction between those classified as victimized and those classified as willing. This has important implications for these findings and for any research using this data and for further research on this topic. For example, a respondent who experienced unwanted intercourse at age 14 and who was a willing participant in what she considers her sexual debut at age 16 would have been included in the "willing" group. However, because she may have been influenced by her prior experience of unwanted intercourse, her subsequent sexual behavior might be more similar to those in the unwilling group. In this analysis, this ambiguity could have resulted in an underestimate of the association between adolescent pregnancy and sexual victimization at first intercourse.

The fact that at least some respondents reported having been raped or forced at their first intercourse—the least ambiguous of the responses to this question—does demonstrate that not all respondents made such a distinction. Nevertheless, discussions with rape

survivors in several cultural contexts (personal communication with author) indicate that none would include an experience of rape as a sexual experience when responding to a survey or count a perpetrator as a sexual partner, even if it was a known assailant. This is an important point for future research on sexual victimization or sexual and reproductive behavior more generally. Researchers constructing questionnaires on these topics should consider carefully what types of experiences and behaviors they exclude by framing questions about sexual behavior in a particular way. For example, when asking respondents about their number of sexual partners, thought should be given to the reasons for asking the question. If the survey's purpose is to investigate the formation of consensual intimate relationships, then framing the questions as they were in this survey may not distort the results. However, if its purpose is to determine one's potential exposure to HIV/AIDS, then the questions should not be framed in the context of intimate sexual partnerships and further questioning about experiences with forced intercourse or forced fellatio may be appropriate, especially in contexts where the prevalence of sexual victimization is high.

A related limitation stemming from the survey questionnaire structure is that only respondents who have ever had sex can be included in the analysis because they are the only respondents who were asked about sexual victimization. This may have introduced a selectivity bias into the sample, as individuals who are sexually victimized before their first voluntary intercourse may avoid sexual activity after the experience and would thus not be included (Cherlin et al. 2004; Jackson et al. 1990; Polusny and Follette 1995). Including only sexually experienced respondents in the analysis overestimates the association between sexual victimization and adolescent pregnancy by, in effect, reducing the denominator. This limitation is not unique to this study, although other studies on this topic may in fact suffer from a more significant bias because they have drawn samples from among individuals who are sexually active rather than simply sexually experienced—from family planning clinics or among those who self-identify as currently sexually active (Berenson, Wiemann and McCombs 2001; Nagy, DiClemente and Adcock 1995; Zierler et al. 1991). Nevertheless, future research should ensure that respondents who are not sexually experienced or who are not currently sexually active

are included. The result will be a much more complete picture of the experience and consequences of sexual victimization.

In spite of these limitations, this analysis makes important methodological improvements over previous research on the topic and offers convincing evidence that some—though not all—sexually victimized girls have a higher hazard of adolescent pregnancy than those who were not victimized. However, the surprising finding that girls experiencing the most severe sexual victimization, forced sex or rape, were no more likely to have an adolescent pregnancy than those who were willing remains unexplained. Future research should investigate the possible mechanisms behind these findings, using theory to guide the development of an appropriate study. In sum, based on the results of this study, a more careful re-examination of the link between sexual victimization and adolescent pregnancy—in the United States and elsewhere—is warranted.

Table 3.1: Proportions and Ns for respondents by description of sexual debut

	Proportion	N
Description of Sexual Debut		
Willing	48.3%	471
Persuaded	32.8%	358
Tricked	9.6%	104
Forced or Raped	9.3%	111
Total	100.0%	1044

Notes: Proportions based on weighted data; Ns are unweighted.

Table 3.3: Results from Cox models examing the hazard of adolescent pregnancy by description of sexual debut (coefficients are hazard ratios; standard errors are in parentheses)

	M1		**M2**	
Description of Sexual Debut				
(Omitted = Willing)				
Persuaded	1.088		1.071	
	(0.164)		(0.160)	
Tricked	2.111	**	2.086	**
	(0.525)		(0.541)	
Forced/Raped	1.168		1.079	
	(0.196)		(0.180)	
Age			1.047	
			(0.031)	
At Grade for Age			0.862	
			(0.118)	
Family Structure				
(Omitted = Lives with neither parent)				
Lives with one biological parent			1.166	
			(0.183)	
Lives with both biological parents			1.143	
			(0.192)	
Household Wealth			0.806	*
			(0.088)	
Wald Chi-square	9.223	*	28.129	***
N	1044		1044	

Notes: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 3.2. Means and percentages for dependent variable and independent control variables by description of sexual debut (standard deviations in parentheses)

	Willing	**Persuaded**	**Tricked**	**Forced/Raped**	**Total**
	Mean or percent	*Mean or percent*	*Mean or percent*	*Mean or percent*	*Mean or percent*
Dependent Variable					
Pregnant before age 20	44.5%	45.9%	69.0%	67.9%	49.44%**
	(0.497)	(0.499)	(0.465)	(0.469)	(0.500)
Control Variables					
Current age	19.06	19.26	18.80	20.18	19.21***
	(2.340)	(2.352)	(2.716)	(2.494)	(2.417)
Household wealth (range: -1.99 to 0.81)	-0.090	-0.158	-0.126	-0.164	-0.123
	(0.576)	(0.543)	(0.506)	(0.584)	(0.560)
By quartiles					
Quartile 1	-0.509	-0.510	-0.483	-0.591	-0.510
Quartile 2	-0.001	-0.139	-0.001	-0.027	-0.027
Quartile 3	0.373	0.210	0.307	0.307	0.307
At expected grade for age at year before debut	47.7%	49.7%	30.9%	32.3%	45.3%†
	(0.501)	(0.500)	(0.501)	(0.470)	(0.498)
Family structure					
Lives with neither biological parent	22.5%	19.2%	33.5%	23.8%	22.6%
Lives with one biological parent	49.8%	46.0%	54.0%	41.2%	48.1%
Lives with both biological parents	27.8%	34.8%	12.5%	35.1%	29.3%
Total Proportion	48.3%	32.8%	9.6%	9.3%	100.0%
N	471	358	104	111	1044

Notes: Figures based on weighted data except for Ns. Stars indicate significant differences between groups. *** p<.001, **p<.01, *p<.05, † p<0.10.

Table 3.4: Results from Cox models comparing the hazard of adolescent pregnancy of tricked (omitted) and forced/raped respondents (coefficients are hazard ratios; standard errors are in parentheses)

	M1		**M2**	
Description of Sexual Debut				
(Omitted = Tricked)				
Forced/Raped Debut	0.608	*	0.546	*
	(0.135)		(0.129)	
Age			0.984	
			(0.050)	
At Grade for Age			0.578	*
			(0.131)	
Family Structure				
(Omitted = Lives with neither parent)				
Lives with one biological parent			1.074	
			(0.332)	
Lives with both biological parents			1.271	
			(0.390)	
Household Wealth			1.085	
			(0.197)	
Wald Chi-square	5.057	*	13.662	*
N	215		215	

Notes: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 3.5: Results from Cox models comparing the hazard of adolescent pregnancy for willing respondents (omitted) and each of the other response groups (coefficients are hazard ratios; standard errors are in parentheses)

	Persuaded Debut		Tricked Debut		Forced/Raped Debut	
	M1	**M2**	**M1**	**M2**	**M1**	**M2**
Description of Sexual Debut						
(Omitted = Willing)						
Persuaded	1.075	1.047	--	--	--	--
	(0.163)	(0.155)				
Tricked	--	--	1.434 **	1.457 **	--	--
			(0.172)	(0.175)		
Forced/Raped	--	--	--	--	1.062	1.037
					(0.059)	(0.061)
Age		1.080 *		1.018		1.052
		(0.033)		(0.044)		(0.041)
At Grade for Age		1.005		0.822		1.031
		(0.148)		(0.148)		(0.184)
Family Structure						
(Omitted = Lives with neither parent)						
Lives with one biological parent		1.164		1.230		1.307
		(0.188)		(0.277)		(0.236)
Lives with both biological parents		1.110		1.445		1.462
		(0.206)		(0.340)		(0.289)
Household Wealth		0.698 **		0.864		0.729 *
		(0.085)		(0.132)		(0.101)
Wald Chi-2	0.231	19.679 **	9.039 **	21.791 **	1.165	13.529 *
N	829	829	575	575	582	582

Notes: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 3.6: Results from Cox models examing the hazard of adolescent pregnancy by description of sexual debut **among those who were not forced to have sex at a later date** (coefficients are hazard ratios; standard errors are in parentheses)

	M1		**M2**	
Description of Sexual Debut				
(Omitted = Willing)				
Persuaded	1.103		1.097	
	(0.179)		(0.173)	
Tricked	2.067	**	2.026	**
	(0.501)		(0.504)	
Forced/Raped	1.153		1.071	
	(0.202)		(0.186)	
Age			1.037	
			(0.032)	
At Grade for Age			0.842	
			(0.120)	
Family Structure				
(Omitted = Lives with neither parent)				
Lives with one biological parent			1.157	
			(0.191)	
Lives with both biological parents			1.091	
			(0.190)	
Household Wealth			0.791	*
			(0.089)	
Wald Chi-square	9.065	*	25.462	**
N	971		971	

Notes: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

Table 3.A1: Results from Cox models examing the hazard of adolescent pregnancy by description of sexual debut -- control variables added one at a time (coefficients are hazard ratios; standard errors are in parentheses)

	Full Original Model		With Age		With At Grade for Age		With Family Structure		With Household Wealth	
Description of Sexual Debut										
(Omitted = Willing)										
Persuaded	1.071		1.075		1.093		1.089		1.085	
	(0.160)		(0.161)		(0.166)		(0.165)		(0.160)	
Tricked	2.086	**	2.089	**	2.115	**	2.126	**	2.073	**
	(0.541)		(0.530)		(0.519)		(0.517)		(0.542)	
Forced/Raped	1.079		1.108		1.132		1.178		1.150	
	(0.180)		(0.186)		(0.189)		(0.198)		(0.194)	
Age	1.047		1.051		--		--		--	
	(0.031)		(0.031)							
At Grade for Age	0.862		--		0.827		--		--	
	(0.118)				(0.109)					
Family Structure										
(Omitted = Lives with neither parent)										
Lives with one biological parent	1.166		--		--		1.160		--	
	(0.183)						(0.182)			
Lives with both biological parents	1.143		--		--		1.095		--	
	(0.192)						(0.189)			
Household Wealth	0.806	*	--		--		--		0.794	*
	(0.088)								(0.084)	
Wald Chi-2	28.129	***	15.520	**	9.790	*	12.345	*	14.599	**
N	1044		1044		1044		1044		1044	

Notes: Models are weighted to accout for complex survey design. *** p<.001, **p<.01, *p<.05.

CHAPTER 4

METHODOLOGICAL CRITIQUE OF THE LITERATURE ON SEXUAL VICTIMIZATION

I. INTRODUCTION

Studies on the sexual victimization of girls and women have produced widely varying prevalence estimates from countries around the world, and sometimes from within the same country setting or cultural context. Some of this variation may reflect actual differences in prevalence in different settings but it may also reflect differences in the methods and measures used in the studies.[12] Restricting the definition of sexual victimization to include only experiences with rape or forced intercourse yields a lifetime prevalence estimate of 4.4 percent among South African women, for example, while expanding the definition to include those who were persuaded to have sex when they did not want to increases that estimate to 7 percent (Republic of South Africa 1998). Similar research in the United States, using a somewhat broader definition of rape that includes attempted and completed vaginal, oral, and anal penetration achieved through the use or threat of force, yields lifetime prevalence estimates of 13.6 percent (Holmes et al. 1996) and 17.6 percent (Tjaden and Thoennes 2006). Research using even broader definitions of sexual victimization, including behaviors like unwanted sexual contact, coercion (including verbal pressure by a partner), or allowing respondents to define their victimization experiences for themselves yield much higher estimates. Surveys in South Africa and India, for example, find that more than one-third of girls and women in India and South Africa and almost half of adolescent girls in Peru have experienced sexual victimization, broadly defined (Cáceres, Marín and Hudes 2000; International Institute for Population Sciences (IIPS) and Macro International 2007; Wood and Jewkes 1998).

[12] This article focuses exclusively on the sexual victimization of girls and women. The victimization of boys and especially of men has not been widely or consistently addressed in the literature.

Although high, many scholars believe that these figures are underestimates. The wide range of prevalence estimates that emerge from the same context, the sensitivity of the topic for victims/survivors (Hamby and Koss 2003; Ruiz-Pérez, Plazaola-Castaño and Vives-Cases 2007), evidence of underreporting of less serious incidents (Jewkes et al. 1999), and the acceptance and/or normalization of sexual victimization in many settings (Fischbach and Herbert 1997; Jewkes et al. 1999; Varga 1997) suggest that many women do not report their victimization experiences on surveys. However, even if one accepts only the lowest prevalence estimates, it is clear that sexual victimization influences a huge number of individuals around the world and represents a significant threat to public health.

Scholars from many disciplines have found statistical associations between sexual victimization and a range of negative consequences. These include sexual and reproductive behaviors and difficulties, such as precocious sexual activity, unprotected intercourse, revictimization, an increase number of lifetime sexual partners, unwanted fertility and fertility during adolescence, sexually transmitted infections, sexual avoidance or dysfunction, chronic pelvic pain and other gynecological problems (Brown et al. 1997; Browning and Laumann 1997; Dietz et al. 1999; Fiscella et al. 1998; Jackson et al. 1990; Miller, Monson and Norton 1995; Nagy, DiClemente and Adcock 1995; Silverman, Gupta and et al. 2007; Silverman et al. 2001; Stock et al. 1997; Wyatt, Newcomb and Riederle 1993). In addition, experiencing sexual victimization is associated with unhealthy weight control behaviors, such as anorexia, bulimia, and abuse of laxatives (Silverman et al. 2001), increases in alcohol, tobacco, and other substance use, and reduced success in completing substance abuse treatment (Briere and Elliott 1994; Silverman et al. 2001). It has also been associated with psychological disturbances like depression, anxiety, post-traumatic stress disorder, suicidality, low self-image, feelings of betrayal, lack of trust, and powerlessness, and the lack of a clear sense of boundaries between oneself and others (Briere and Elliott 1994; Fergusson, Horwood and Lynskey 1997; Kendall-Tackett, Williams and Finkelhor 1993; Laumann et al. 1994; Thompson et al. 1997; Whitmire et al. 1999). Finally, sexual victimization has been linked to relationship difficulties, such as distrust of others, discomfort with intimacy,

and reduced relationship satisfaction (English 1998; Loeb et al. 2002; Polusny and Follette 1995).

However, the literature is full of inconsistencies about the strength and magnitude of these associations. For example, while some studies demonstrate a strong, statistically significant association with the risk of adolescent pregnancy (e.g., Chandy, Blum and Resnick 1996; Jewkes et al. 2001; Kenney, Reinholtz and Angelini 1997; Nagy, DiClemente and Adcock 1995; Romans, Martin and Morris 1997; Silverman et al. 2001; Zierler et al. 1991), others find the association to be insignificant (Adams and East 1999; Herman-Giddens et al. 1998; Smith 1996; Widom and Kuhns 1996), and others find a significant association only moderated through other variables, like sexual precocity (Roosa et al. 1997; Stock et al. 1997). Moreover, at least one literature review concluded that a causal relationship between sexual victimization and adolescent pregnancy cannot be supported by the literature as a whole (Blinn-Pike et al. 2002).

These inconsistencies may be due in part to the wide assortment of definitions, methods, and measures used in studies on this topic. These differences make comparing the findings of studies to one another difficult, slowing the accumulation of knowledge about the risk and consequences of sexual victimization. However, the accumulation of knowledge has been hampered further by significant methodological limitations in many studies that weaken or undermine the validity of their findings. Thus in spite of the considerable attention that has been directed toward sexual victimization, it is still difficult to draw firm conclusions about its prevalence and consequences.

This critique provides a substantive methodological critique of existing research on sexual victimization and offers examples of how methodological limitations and inconsistencies in the definitions, methods, and measures may affect the research findings and impede the accumulation of knowledge. In the next section, I describe the main purposes of this critique as well as the terminology and the methods used to conduct it.

II. TERMINOLOGY, PURPOSES, AND METHODS

A. PURPOSES

The many definitions, methods, and measures used to study sexual victimization make the comparison of "apples to apples" challenging. Further, many methodological shortcomings undermine the validity of what we "know" about the risks and consequences of sexual victimization. Are sexual victimization survivors more likely to get pregnant during adolescence or have an unwanted pregnancy than non-survivors? Are they more likely to have unprotected sex? To be revictimized? Have lower educational attainment? These and other relevant questions have important implications for individuals, programs, policies, and society at large, but we cannot answer them with any certainty based upon existing research. In this critique, I seek to identify the main issues and limitations that prevent us from reaching more definitive conclusions about the causes and consequences of sexual victimization. In particular, this critique has four main purposes:

1. Discuss the obstacles that arise when comparing the findings from different studies on sexual victimization, including the operationalization of sexual victimization and the definition of commonly studied outcomes.

2. Identify methodological shortcomings in the design and analysis of research on sexual victimization, focusing on those that have not been widely noted in the literature and that undermine the validity of findings.

3. Make recommendations for future research

B. TERMINOLOGY

The literature uses a large number of different terms to indicate experiences of unwanted sexual contact, including sexual coercion, forced sex, rape, sexual assault, sexual violence, intimate partner violence (which usually includes non-sexual physical violence in addition to sexual violence), violence against women, unwanted sexual intercourse,

dating violence, date rape, childhood sexual abuse, domestic violence, and so on. I use the term "sexual victimization" here to encompass the most commonly used terms and adopt a definition of sexual victimization in keeping with the general consensus in the literature on this topic. By this term, I mean any activity of a sexual nature in which an individual of any age is unwilling or accedes under duress, or involves the abuse of any power differential between individuals and is not limited to incidents involving physical force. It also includes any such activity occurring between an individual younger than age 13 involving someone 5 or more years older. [I discuss the implications of this wide range of terms in greater detail in Section III.]

C. AUDIENCE

This critique targets two main audiences. First, I target scholars of numerous disciplines who have studied sexual victimization and related topics in the past, to help to identify ways that future research might benefit from methodological improvements. Second, I target scholars who have not previously studied sexual victimization but who have become aware that it may influence some of the outcomes of interest to them. For example, many scholars have recently become aware that sexual victimization may influence the acquisition of HIV/AIDS and its subsequent spread to others. Gaining a more complete understanding of the ways that sexual victimization may influence relationship dynamics in such a context may offer considerable insight to stem the spread of HIV and other sexually transmitted infections.

D. METHODS

Although this is not a literature review in the traditional sense, I reviewed hundreds of empirical articles and literature reviews on sexual victimization to derive the specific critiques I present here. I chose articles to represent a number of disciplines, including psychology, psychiatry, social work, sociology, family studies, criminology, medicine, and public health, and to include articles using a range of conceptualizations and measures of sexual victimization. The studies I reviewed for this article include those focused on establishing prevalence levels, its predictors or "risk factors," and many

common outcomes or consequences. The references cited should be taken as examples only, not exhaustive lists of the articles to support a specific point.

Unless otherwise noted, I limit my discussion to survey-based studies, for two reasons. First, survey-based are the most commonly used methods of studying sexual victimization regardless of discipline. Although qualitative methods have been used to good effect in many disciplines and can add depth to our understanding of such a complex topic as sexual victimization, they are not as widely used. Consequently, a critique of those methods would not have as large an effect on the literature as a whole as a critique of survey-based methods. Moreover, because qualitative methods have different philosophical underpinnings and different methodological standards from survey research methods, it would not be useful to compare studies using qualitative methods to those using survey-based methods. I also focus on survey research because of its importance in policy formulation and program design; most policies and programs rely on estimates of prevalence and magnitude of consequences derived from survey research. Consequently, it is particularly important to ensure that these estimates are high-quality and scientifically defensible in order to build political support for action (Heise, Moore and Toubia 1995).

Because much of the research on sexual victimization has been conducted in North America, the articles I initially identified reflected this bias. Thus I sought to identify as many additional studies conducted in developing countries as possible to offset this bias. A complete list of the articles reviewed is available from the author. Most of the literature has been published in peer-reviewed journals, but some of the articles—especially those from developing countries—come from the so-called "grey literature," from reports written by non-governmental and multilateral governments about this topic. While ideally all of the articles would have come from peer-reviewed sources, this restriction would have reduced the geographical representation of the research presented here.

It is equally important to be clear on what this critique is not. First, this is not intended to be a comprehensive review of the sexual victimization literature; I have not reviewed every article published on the topic. Moreover, while I have reviewed hundreds of

articles, I make no attempt to summarize them here. I leave that to the many reviews of this literature already published (Beitchman et al. 1992; Berlo and Ensink 2000; Briere and Elliott 1994; Browne and Finkelhor 1986; Davis and Petretic-Jackson 2000; Jumper 1995; Kendall-Tackett, Williams and Finkelhor 1993; Leonard and Follette 2002; Loeb et al. 2002; Putnam 2003). Second, it is not a comprehensive methodological critique; I make no attempt to address methodological limitations or critiques covered quite capably elsewhere (Ellsberg and Heise 2005; Ellsberg et al. 2001; Hamby and Koss 2003; Ruiz-Pérez, Plazaola-Castaño and Vives-Cases 2007). Rather, this is a targeted critique that addresses limitations and shortcomings that have not received attention in the published literature to date.

In addition, there are two significant subtopics within the literature that I do not address here, including studies of rape during conflict or war or the sexual trafficking of women and girls. Both of these topics are important for understanding the vulnerabilities of girls and young women in such contexts. However, research on both subtopics is complicated considerably by a host of other factors, contextual and otherwise, and this critique cannot address them appropriately.

CAVEAT: Such a critique—one that examines research by scholars from many disciplines—invariably runs up against the issue that each discipline has its own criteria for "knowledge" or "truth," and for what constitutes "high-quality research." While sexual victimization has been addressed by scholars in many disciplines, the literatures have developed largely separately from one another, in part because of the different language, theories, and methods used in each discipline. One unfortunate result is that our understanding of sexual victimization has not benefited sufficiently from the knowledge generated across disciplines. Some cross-fertilization has taken place, with scholars from one discipline borrowing methods or questionnaire modules from research conducted in another discipline, but this has not been as careful, consistent, or thorough as it could have been. This process has resulted in, for example, surveys designed by social demographers and public health specialists that borrow only a handful of questions from lengthy validated modules on mental health, and surveys by psychologists using little of

what are considered the best practices in survey research methods in other disciplines. While it is doubtful that scholars from different disciplines will ever agree on one best way to define or study the topic, a more careful process of cross-fertilization can only benefit our understanding of sexual victimization. Although this critique is inevitably grounded in my training as a sociologist and a demographer, I hope that it will help to improve research across all disciplines and aid in the cross-fertilization process.

In the next section, I discuss several factors that make comparisons between studies difficult and impede the drawing of conclusions about the state of the literature, including the different ways that researchers have defined their samples, the concept of sexual victimization, and many of the commonly studied consequences or outcomes. Section IV addresses the main methodological limitations in sampling and data collection that undermine the validity of the findings. Section V addresses issues arising from the analysis phase that weaken the findings of published research. The final section summarizes the arguments of this critique.

III. THE "APPLES TO APPLES" PROBLEM, OR WHY WE DON'T KNOW WHAT WE KNOW ABOUT SEXUAL VICTIMIZATION

A brief look at the sexual victimization literature reveals the difficulty of drawing conclusions about its prevalence and consequences, in part because comparing "apples to apples" is challenging. Few studies have defined the samples and concepts in the same way or used the same methods. While the issues discussed in this section are not shortcomings of individual studies, they create obstacles to comparing the results from one study with another or trying to get a sense of the literature as a whole.

Some, though not all, of the issues discussed in this section have been identified previously (see, for example, Blinn-Pike et al. 2002; Ruiz-Pérez, Plazaola-Castaño and Vives-Cases 2007). I reiterate them here and add others because of the considerable

difficulties they pose for researchers and, perhaps more importantly, for intervention specialists and policymakers.

E. DEFININING AND OPERATIONALIZING SEXUAL VICTIMIZATION

Two initial problems arise in writing a review or critique of this literature: (1) the wide range of experiences that researchers define as "sexual victimization" and (2) the range of terms used to describe the same experiences. This issue arises at both the design phase and the analysis phase, when conceptualizing sexual victimization and developing the survey questionnaire and again when deciding how to use the available data.

With respect to the first problem, some studies focus only on the extremes of sexual victimization, such as rape (Berenson, Wiemann and McCombs 2001) or forced sex (Adams and East 1999; Dunkle et al. 2004; Jewkes et al. 2001a; Tjaden and Thoennes 2006) and a few on the slightly more general "nonconsensual sex" (Republic of South Africa 1998; Zweig et al. 1999). Others include a wide range of experiences, ranging from unwanted sexual requests, fondling, or exposure to pornography (Boney-McCoy and Finkelhor 1995; Williamson et al. 2002), while still others ask general questions (Luster and Small 1997a; Rainey, Stevens-Simon and Kaplan 1995; Silverman et al. 2001), such as "have you ever had any sexual experience involving physical contact that was against your will?" (Welch and Fairburn 1996), to allow respondents to define sexual victimization for themselves. Complicating matters even further, the same researchers sometimes use different terms to describe what are ostensibly the same experience(s). For example, as Hamby and Koss (2003) note, the questionnaire used in the National Violence Against Women survey in the United States uses both "unwanted sex" and "forced sex" without indicating whether differences in meaning were intended.

Another challenge is presented by the issue that different researchers use the same term to describe different experiences; this is most evident with the study of sexual victimization during childhood. While many of these studies use the same terminology (usually "childhood sexual abuse") to describe the experiences they investigate, the definitions of "childhood" vary considerably. Some investigate victimization occurring before age 12

or 13 (Fiscella et al. 1998; Laumann et al. 1994; Roberts et al. 2004; Widom and Kuhns 1996), while others examine experiences before age 16 or age 18 (Berenson, Wiemann and McCombs 2001; Boyer and Fine 1992; Butler and Burton 1990; Dietz et al. 1999; Felitti 1993; Felitti et al. 1998; Fergusson, Horwood and Lynskey 1997; Fergusson, Lynskey and Horwood 1996; Roosa, Reinholtz and Angelini 1999; Roosa et al. 1997; Walker et al. 1999; Williamson et al. 2002).

While of course decisions about who to include in a sample are usually made based on specific theoretical rationales or, in the analysis phase, necessitated by the data available, the differences across studies make it inappropriate to compare the findings from them. Because of their very different levels of emotional, intellectual, and physical development, a child of 10 may have very different responses to sexual victimization from a child of 16 or 18. What conclusions can we draw from studies using vastly different age cut-offs to define it? The literature as a whole would benefit if scholars of future research selected samples with an eye toward consistency with previous literature.

Research has also demonstrated that prevalence estimates vary simply depending on the number of questions about sexual victimization included in the survey (Hamby and Koss 2003; Tjaden and Thoennes 2006). Studies vary widely in how much information is collected from respondents about abuse. At one extreme are studies that ask for responses to a single question about whether the respondent had ever been hurt sexually (Silverman et al. 2001), been forced to have sex (Pallitto, Campbell and O'Campo 2005) or ever experienced sexual victimization more generally (Luster and Small 1997a; Nagy, DiClemente and Adcock 1995; Rainey, Stevens-Simon and Kaplan 1995; Stock et al. 1997; Williamson et al. 2002). The latter have used general questions like "have you ever had any sexual experience involving physical contact that was against your will?" (Welch and Fairburn 1996), "have you ever had any event that you consider to be victimization in your past?" (Rainey, Stevens-Simon and Kaplan 1995), or "has someone ever touched you in a place you did not want to be touched or do something to you sexually that you did not want?" (Nagy, DiClemente and Adcock 1995; Stock et al. 1997) to determine whether victimization has occurred. At the other extreme are studies that contain multiple

questions about victimization, allowing for multiple events and using long lists of behaviorally-focused questions to collect information about different episodes, its frequency, and relationship to the perpetrator(s) (Bledsoe and Cohen 1993; Fergusson, Horwood and Lynskey 1997; Romans, Martin and Morris 1997; Williamson et al. 2002). Naturally the wide range of experiences included in studies on the topic makes it difficult to draw conclusions from studies ostensibly on the same topic.

These issues go beyond the semantic. Koss (1985) recommends against using labels like "rape" or "abuse" because some victims may not be "willing or able to label their experience in those terms" (Zweig et al. 1999: 400). Instead, she recommends using behaviorally-focused questions, which may increase the reporting of relevant behaviors (Koss 1993). This would also help to address differences in the meaning of terms in different contexts. Research in many countries, including South Africa, the US, the UK, and Canada, has revealed distinctions between the terms "rape" and "forced sex"; rape is typically reserved for forced intercourse perpetrated by a stranger or strangers while forced sex describes forced intercourse between intimate partners or individuals who are acquainted with one another (Hamby and Koss 2003; Wood, Maforah and Jewkes 1998).

Furthermore, both prevalence estimates and associations with hypothesized consequences can vary sharply with changes in definition (Hamby and Koss 2003). In fact, one study demonstrated this point by comparing the association between sexual victimization and depression using different definitions of victimization (Roosa et al. 1998). Not only did they obtain vastly different estimates of victimization prevalence with each definition, but they found that the way they defined victimization determined whether they found a significant association at all between victimization and depression and the strength of that association.

Others have already directed attention toward such definitional inconsistencies, as well as other issues related to the implementation of surveys on sexual victimization (Bolen and Scannapieco 1999; Ellsberg and Heise 2005; Hamby and Koss 2003), so I will not belabor these issues further. However, recognizing the importance of using questions that resonate most closely with the intended respondents of surveys, future studies on

victimization should attempt to use definitions that have already been tested in other studies to facilitate the comparison of analytical results and strengthen the body of evidence on this topic.

F. DEFINING OUTCOME VARIABLES

Inconsistency also extends to the definitions of the outcomes commonly examined in the literature. One example can be found in studies investigating whether sexually victimized individuals are more likely than non-victimized individuals to have multiple sexual partners. Some studies examining this association include the actual number of sexual partners in their models (Luster and Small 1997a; Noll, Trickett and Putnam 2003), while others use a particular cut-off point to determine whether the person has multiple sexual partners, such as having had more than one partner total (Stock et al. 1997), more than three partners in the past 90 days (Silverman et al. 2001), more than five partners between ages 14 and 18 (Fergusson, Horwood and Lynskey 1997), or more than ten partners in the previous year (Widom and Kuhns 1996). Another example is found in studies examining sexual victimization and adolescent pregnancy. Some of these studies define adolescent pregnancy as occurring before age 18 (Fergusson, Horwood and Lynskey 1997; Kenney, Reinholtz and Angelini 1997; Rainey, Stevens-Simon and Kaplan 1995; Zierler et al. 1991), ages 19 and under (Boyer and Fine 1992), by age 20 (Lee-Rife 2008 (manuscript)), and at least one did not specify an age range (Adams and East 1999). Another set of studies sampled girls in junior high or high school and simply determined whether or not they had been pregnant by the time of the survey; these studies included girls up through grade 12, so roughly up through age 18 (Chandy, Blum and Resnick 1996; Nagy, DiClemente and Adcock 1995; Silverman et al. 2001; Smith 1996; Stock et al. 1997). Coupled with other methodological problems in these studies (discussed elsewhere in this volume), the lack of comparability across studies makes comparisons of their findings challenging. There is no systematic variation in the findings by the definition used, although certainly these studies would be expected to produce, at a minimum, different estimates of adolescent pregnancy risk because the respondents were exposed to the risk of adolescent pregnancy for different periods of time.

Notably, some of the associations with sexual victimization are surprisingly robust to differences in the measurement of the outcome variable; this is true for the studies on multiple sexual partners described above and also among studies examining sexual victimization and depression. With respect to the latter topic, one study investigated major depressive episodes using a lengthy questionnaire based on the Composite International Diagnostic Interview (CIDI) (Fergusson, Horwood and Lynskey 1996) and another study used the University of Michigan version of the CIDI (Molnar, Buka and Kessler 2001), another used the 20-item Center for Epidemiologic Studies Depression Scale (Roosa, Reinholtz and Angelini 1999), and another investigated "sadness" in the past month using just one question: "How many times in the past month have you felt sad?" (Boney-McCoy and Finkelhor 1995), all with little difference in their findings. Nevertheless, more consistency in the measurement of outcome variables—to the extent possible given the need to adjust for contextual differences—would assist in the accumulation of knowledge about the field.

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Some efforts have been made to address the inconsistencies of studies on this topic, particularly in the United States and particularly toward standardizing the questions about sexual victimization itself. Many researchers have developed and validated tools to measure sexual victimization; a recent review identified 26 screening instruments and 14 diagnostic instruments developed for the purpose of studying sexual victimization (Jiménez Rodrigo and Ruiz-Perez n.d.). Others have exerted considerable effort into understanding influences of variations in survey implementation techniques on responses; one study found that providing training for survey interviewers on sexual victimization and on dealing with emotionally distraught respondents influenced the rapport the interviewers were able to build with respondents and consequently improved response rates, while interviewer fatigue from long survey questionnaires—and exacerbated by the emotional stress of talking with sexually victimized respondents—seemed to reduce response rates (Ellsberg et al. 2001). Other scholars have investigated how respondents interpret different questions and terms about sexual violence (Bolen and Scannapieco 1999; Ellsberg and Heise 2005; Ellsberg et al. 2001; Hamby and Koss 2003; Ruiz-Pérez,

Plazaola-Castaño and Vives-Cases 2007). These efforts are important steps to facilitate the accumulation of knowledge on this topic, and must continue.

However, an even larger barrier to our understanding of sexual victimization is the methodological shortcomings that are found throughout the research on this topic. In the next section, I discuss some of these methodological limitations and provide examples of how they may influence research results. Improvements in the methodological soundness of future research will have a much greater impact on our understanding of its causes and consequences.

IV. LIMITATIONS OF RESEARCH DESIGN

Shortcomings of the existing literature on sexual victimization undermine the validity of study findings and hinder our understanding of its risk factors and consequences. Among these are sampling issues, including significant sample selectivity and the failure to attend to issues of racial/ethnic diversity, the failure to ascertain the temporal ordering of sexual victimization experiences relative to its "causes" or related "consequences," and a number of issues related to data collection.

G. RACIAL/ETHNIC DIVERSITY

One of the most important shortcomings of the literature on sexual victimization is the failure to attend to issues of racial/ethnic diversity in sampling.[13] Most survey research in the social sciences and public health relies on the identification of racial and ethnic subgroupings because of important differences between groups in health status, education, and socioeconomic resources. While nationally-representative surveys may contain large enough samples of certain racial/ethnic minority group members to allow comparisons across racial/ethnic groups (e.g., White versus African American), these overall group comparisons can mask important variation among subgroups. However, few of the surveys used in studies of sexual victimization have enough members of

[13] Issues related to the role of race/ethnicity in analysis will be addressed in Section V.

racial/ethnic minority groups to allow for the analysis of within-group differences in their experience.

This is an important limitation for a number of reasons, in part because many studies have demonstrated variations in the prevalence of sexual victimization by race/ethnicity (Kenney, Reinholtz and Angelini 1997; Roosa et al. 1997; Tjaden and Thoennes 2006) and in many of the outcomes under examination (Alan Guttmacher Institute 1996; Kessler and Magee 1993; Kessler et al. 2001). Furthermore, that at least one study has found that an association between sexual victimization and psychosocial adjustment disappears after controlling for race/ethnicity (Higgins and McCabe 1994), while another found that the association remains significant (Mullen et al. 1993) suggests that such variables should be examined more closely. Moreover, studies that do not contain sufficient numbers of racial/ethnic minority group members cannot examine within-group variation and test for additive or interactive effects of race/ethnicity with other variables.

The failure to include individuals from racial/ethnic minority groups (or enough of them) in such research has important implications for our understanding of sexual victimization, for several reasons. First, racial/ethnic discrimination may increase the likelihood that an individual experiences sexual victimization in the first place. An individual may be singled out for sexual victimization **because** she is a member of a racial/ethnic minority. For example, sexual victimization has often been used as an instrument of aggression in war or ethnic conflict, as it has been in conflicts in Darfur, Rwanda, and elsewhere. Perhaps more commonly, a member of a racial/ethnic minority group may simply be victimized because her lower status makes her more vulnerable to exploitation or less able to negotiate the terms of intercourse; for example, slaves of African American heritage or descent were routinely victimized by their owners in the United States (Davis 2006) and lower caste women are routinely raped by upper caste men and police officers in India (Human Rights Watch 1999).

Moreover, racial/ethnic discrimination may increase stress levels among potential perpetrators, increasing their likelihood of perpetrating sexual victimization. By virtue of their more frequent contact with members of the same racial/ethnic minority group, this

may thus increase the risk of sexual victimization for other members of the same group. In addition, since members of racial/ethnic minority groups are more likely to live in poverty in many countries (e.g., McKinnon 2003; Statistics South Africa 2007), they may live in riskier areas that put them at higher risk of experiencing sexual victimization.

Being a member of a racial/ethnic minority group may also simply exacerbate the consequences of sexual victimization. For example, experiencing racial/ethnic discrimination may increase stress (Harrell, Hall and Taliaferro 2003), which may make it more difficult to overcome the trauma of sexual victimization. Furthermore, because they are often also poor, they may be more vulnerable in other ways that increase their risk of experiencing sexual victimization or give them fewer resources with which to cope with sexual victimization—fewer resources for psychotherapy or for legal assistance or to leave a situation that puts them at risk for repeated victimization. For example, the limited freedom of movement and low status of lower caste individuals in India may make it impossible for a woman to escape the situation in which she is being sexually victimized. Finally, members of racial/ethnic minorities may be treated poorly by the health care or legal professionals or government authorities from whom they seek help after their experience. All of these possibilities may exacerbate the negative consequences.

The failure in much of the literature to attend to diversity within a single context indicates that generalizing the results to a wider population; what we "know" about sexual victimization does not reflect the differential experiences of subgroups in a given population. One important contribution that sociologists could make to the study of sexual victimization is to bring to bear the vast body of literature on social structural inequalities (by race, socioeconomic status, gender, and other characteristics) and call attention to the importance of this omission.

H. OTHER SAMPLE SELECTIVITY

Another related problem in the literature on sexual victimization is the number of studies that rely upon small and otherwise highly selective samples. Compounding their lack of

generalizability, the samples from many studies are selective in several different ways. For example, a considerable number of the studies reviewed were conducted on small, convenience samples, drawn from family planning clinics, antenatal clinics, low-income community centers and similar locations (Adams and East 1999; Berenson, Wiemann and McCombs 2001; Boyer and Fine 1992; Campbell and MacPhail 2002; Jewkes et al. 2001b; Noll, Trickett and Putnam 2003; Rainey, Stevens-Simon and Kaplan 1995; Smith 1996; Welch and Fairburn 1996; Zierler et al. 1991; Zweig et al. 1999). Two widely cited studies linking victimization and adolescent pregnancy relied on samples of just 41 (Butler and Burton 1990) and 75 (Zierler et al. 1991) women respectively, although the article by Butler and Burton was explicitly exploratory. One study enrolled participants who were pregnant African-American women from an inner city hospital who had had no previous live births or stillbirths, no more than two spontaneous or therapeutic abortions, and at least two of the following characteristics: (a) unmarried; (b) less than 12 years education; (c) unemployed (Fiscella et al. 1998). On one hand, such selectivity may help to ensure a largely homogenous sample by eliminating potentially confounding variables or minimizing their effects. On the other, the findings from such a study are not generalizable to a larger population.

Other studies used somewhat larger samples, but these were rarely drawn using probability sampling techniques (Adams and East 1999; Berenson, Wiemann and McCombs 2001; Campbell and MacPhail 2002; Fergusson, Horwood and Lynskey 1997; Noll, Trickett and Putnam 2003; Rainey, Stevens-Simon and Kaplan 1995; Rodgers et al. 2004; Smith 1996). While a number of studies have used nationally- or state-representative probability samples (Boney-McCoy and Finkelhor 1995; Chandy, Blum and Resnick 1996; Holmes et al. 1996; Luster and Small 1997a; Williamson et al. 2002), these are significantly less common and many have other study design limitations (detailed elsewhere in this article).

Such studies **can** be useful in generating hypotheses or gaining a nuanced understanding of a context and often allow more in-depth information to be collected. However, in many of the studies noted here, a straightforward survey has been conducted on a small

sample. In most of these studies—and when these studies have been cited by other scholars, selectivity has generally been given little attention.

Selectivity is an important issue to address in survey research because it precludes generalizability to larger populations and thus moderates the conclusions that can be drawn from them. However, in a number of the studies reviewed here, the selectivity of the sample introduces an especially important bias into the findings beyond a simple lack of generalizability. That is, a number of studies have drawn samples from among individuals who are sexually active—from family planning clinics or among those who self-identify as currently sexually active (Berenson, Wiemann and McCombs 2001; Felitti et al. 1998; Nagy, DiClemente and Adcock 1995; 1995; Saewyc, Magee and Pettingell 2004; Zierler et al. 1991). Including only sexually experienced respondents may overestimate the association between the outcomes and sexual victimization by, in effect, reducing the denominator. For example, in their study of associations between sexual victimization and sexual risk-taking, Rainey and colleagues (1995) limited their sample to sexually active teenage girls from a teen center. Sexual dysfunction (Beitchman et al. 1992; Berlo and Ensink 2000), sexual or relationship avoidance (Jackson et al. 1990), and relationship formation difficulties (Cherlin et al. 2004; Polusny and Follette 1995) are commonly reported consequences of sexual victimization; thus an unknown and perhaps significant proportion of sexually victimized individuals may withdraw from sexual relationships altogether or have difficulty becoming involved in intimate partnerships. Thus examining subsequent sexual behavior only among those who remain or become sexually active may overestimate the sexual behavior of sexually victimized girls by excluding those who have withdrawn from or have not formed sexual relationships. Future research should ensure that respondents who are not sexually experienced or currently sexually active are also included in research on sexual victimization. The result will be a much more complete picture of the experience and its consequences.

Of course, many studies end up with selective samples because the resources for a larger or otherwise less selective sample are not available. Researchers must learn what they are

able with the data or funding available. However, the authors of smaller studies (and those who cite them) must be circumspect about the limitations of their findings and be attentive to the ways that the selectivity may influence them.

I. TEMPORAL ORDERING

Another troubling issue in many of the studies reviewed here is the failure to determine the temporal ordering of the dependent and independent variables. That is, many studies failed to—or were unable to—ascertain whether the episodes of sexual victimization actually preceded the outcome(s) in question (Berenson, Wiemann and McCombs 2001; Butler and Burton 1990; Hillis et al. 2000; Nagy, DiClemente and Adcock 1995; Rainey, Stevens-Simon and Kaplan 1995; Raj, Silverman and Amaro 2000; Saewyc, Magee and Pettingell 2004; Silverman et al. 2001; Stock et al. 1997), and many did not acknowledge this limitation in their discussion. Wise and colleagues (Wise et al. 2001) did attempt to address this issue by conducting a separate analysis on those whose victimization **likely** preceded the onset of depression based on other clues in the data, but other studies did not, or could not, take similar steps. While the preponderance of cross-sectional data available for social science research makes this a common problem, this limitation makes it doubly important to temper the findings if causal ordering cannot be determined. While determining temporal ordering of the variables in question does not automatically establish a causal relationship between them, failing to establish temporal ordering calls it into question or precludes it entirely. Furthermore, since both sexual victimization and many of the so-called consequences have sometimes been found to be associated with variables like poverty (Hallman 2005; Kirby, Coyle and Gould 2001; Martin and al. 1999a; Martin and al. 1999b), failing to determine if one event preceded another makes it impossible to rule out confounding. But without temporal ordering, we cannot distinguish consequences from confounding variables and the conclusions we can draw from such studies are limited. In addition, since some studies have found that men may victimize their female partners sexually or physically in response to an unintended pregnancy (Berenson, San Miguel and Wilkinson 1992; International Institute for Population Sciences (IIPS) and Macro International 2007; Pallitto and O'Campo 2004; Republic of South Africa 1998) while others have found that unintended pregnancies may result from

sexual victimization (Holmes et al. 1996; Pallitto, Campbell and O'Campo 2005), it is especially important to determine temporal ordering in particular types of studies. Future data collection efforts should address this important methodological limitation.

There are simple improvements that can be made to cross-sectional studies to address this limitation, such as including questions on the timing of various events or using a life-history calendar, a method of collecting detailed information from individuals on the timing and sequencing of life events. A life history calendar uses a matrix format that provides visual cues—in the form of column headings marked with years and ages and reports from respondents about other important events that are more easily timed—to help respondents to recall the relative timing of other life events (Axinn, Pearce and Ghimire 1999). For example, a respondent may be unable to answer a question asking her to supply the year she was sexually victimized, but she may be better able to determine this if she can determine when it happened relative to other events that are more easily recalled, such as the year she started high school or her mother remarried. Moreover, the life history calendar may be useful in surveys of individuals experiencing high levels of stress—as they may after being sexually victimized or if they live in poverty or are otherwise vulnerable—because it encourages individuals to think about events in the context of one another and may assist with recall. Not only would information from a life history calendar allow researchers to address the important issue of temporal ordering, but it may improve the overall quality of the data by reducing recall bias. Additional information on the timing of sexual victimization may also be useful as there is some evidence that the consequences of sexual victimization differ depending on when it occurred (e.g., during adolescence or adulthood) (Benda and Corwyn 2002) and that the influences of traumatic events may diminish over time (McLanahan and Bumpass 1988).

Furthermore, donors must be more open to the prospect of funding longitudinal studies that allow researchers to determine the ordering of various experiences. While such studies may introduce other difficulties, including the potential selective loss to follow-up of traumatized individuals, they still offer an opportunity to gather important information on the timing of life events and generally improve data quality.

In general, then, additional information on the timing of sexual victimization and other life events will strengthen our understanding of the causes and consequences of sexual victimization. Perhaps more importantly, additional information on timing can help in the development of more comprehensive understandings of behavioral influences.

J. DATA COLLECTION

Considerable research has established the importance of certain characteristics of the victimization experience in predicting whether negative consequences occur and their magnitude. These include the number of incidents, their severity and duration, the extent of physical coercion, the victim's relationship to the perpetrator, whether penetration was involved, and the age of the individual at the time of victimization (Cherlin et al. 2004; Kendall-Tackett, Williams and Finkelhor 1993; Roberts et al. 2004; Trickett and Putnam 1998; Zweig et al. 1999). In addition, the support available to the victim may also be important, but this has not been found in all studies (Tremblay, Hérbert and Piché 1999). Unfortunately, many studies on this topic do not collect much contextual information; the lack of contextual details reduces the precision of the findings and the strength of the conclusions that are possible. The following sub-sections describe various manifestations of this problem, including the lack of attention to the identity of the perpetrator, the experience of other victimization, the timing and severity of the experience (s), and some issues about the structure and framing of the survey questionnaires.

a. Perpetrators

As noted above, experiencing negative consequences of sexual victimization is associated with the relationship the respondent has with the perpetrator; for example, individuals victimized by a family member often have more severe consequences than those victimized by strangers, dates, and friends/acquaintances. In spite of many unequivocal findings on this matter, however, questions about relationships with the perpetrator(s) are not very common on surveys except for some of those focusing on victimization during childhood. Some omit questions entirely (Luster and Small 1997a; Luster and Small 1997b; Raj, Silverman and Amaro 2000; Stock et al. 1997), while others request limited information. For example, in the 1998 South Africa Demographic and Health Survey,

respondents were only asked their relationship to the perpetrator if the victimization experience occurred before age 15 (Republic of South Africa 1998). A related issue is that respondents were only permitted to provide one answer to the question about the perpetrator identity, precluding multiple experiences or multiple perpetrators in the same incident. As revictimization is not uncommon (Cherlin et al. 2004; Dunkle et al. 2004; Polusny and Follette 1995; Rickert et al. 2004) and victimization involving multiple perpetrators, though more rare, could have particularly serious consequences, these limitations are unfortunate. Other examples include the Durban Transitions to Adulthood in the Context of HIV/AIDS study (Rutenberg et al. 2001) and the Cape Area Panel Study (Lam, Seekings and et al. 2005), which only asked about victimization in the context of sexual relationships and may have inadvertently excluded victimization by strangers or relationships that the respondent did not consider to be sexual, as might be the case when victimized by a relative or with violence.

Results from studies that **have** asked about the relationship to the perpetrator underscore why this knowledge is critical. First, as noted above, these studies have shown that sexual victimization by family members has more serious consequences. Second, the identity of the perpetrator may influence specific consequences. For example, studies in sub-Saharan Africa have shown that teachers are commonly named as perpetrators of sexual victimization among girls (Ajayi et al. 1997; Republic of South Africa 1998), raising concern for the educational attainment of the girls involved. Girls sexually victimized by teachers may find it difficult to face the teacher following the victimization and may miss school or perform poorly to avoid the prospect. Moreover, sexual victimization or the fear of it could simply deter students from participating fully in academic life. Clearly, then, the identity of the perpetrator may have ramifications for educational attainment that may not be relevant if the perpetrator is stranger or boyfriend. However, without specifying the perpetrator, associations between sexual victimization and educational attainment might be obscured because on average, there is no association between them. Clearly this has important implications for research and results and ensuring success of programmatic and policy efforts.

b. Other Victimization

Another problem frequently found in the literature is the failure to account for other victimization experiences—other episodes of sexual victimization or other types of victimization (e.g., physical abuse), incidents that may exacerbate the consequences of sexual victimization.

Few studies allow for the possibility that their respondents could experience other sexual victimization. A number of studies have shown that an experience of sexual victimization increases the likelihood that the victim will be sexually victimized again in the future (Beitchman et al. 1992; Cherlin et al. 2004; Dunkle et al. 2004; Laumann et al. 1994; Polusny and Follette 1995). Moreover, other studies have established that the consequences of sexual victimization appear to be more severe if the victimization was frequent and/or ongoing (Kendall-Tackett, Williams and Finkelhor 1993; Roberts et al. 2004). In fact, one study (Norris, Kaniasty and Thompson 1997) found that the persistence of victims' symptoms of mental illness over time was aggravated by subsequent sexual victimization. Thus someone experiencing multiple episodes of sexual victimization may be more traumatized than someone experiencing just one. Future studies should attend to the possibility of multiple episodes of sexual victimization, especially where exposure to sexual victimization is quite widespread.

A similar problem arises with respect to other **types** of victimization, such as physical abuse, neglect, and verbal/psychological abuse. Few studies considered that their respondents could have been exposed to other types of abuse or violence, such as physical abuse, emotional abuse, violent crime, or neglect, in addition to sexual victimization (e.g., Dietz et al. 1999; Felitti et al. 1998; Fiscella et al. 1998; Luster and Small 1997a; Silverman et al. 2001). The failure to incorporate other victimization experiences is important because previous studies have found that experiencing multiple forms of victimization is not uncommon (Adams and East 1999; Briere and Elliott 2003; Dong et al. 2003; Ellsberg et al. 2000; Jewkes et al. 1999; Pallitto and O'Campo 2004; Smith, White and Holland 2003; Turner, Finkelhor and Ormrod 2006; Williamson et al. 2002) and others have found an additive effect of different types of victimization or other

adversity (Felitti et al. 1998; Fiscella et al. 1998; Hillis et al. 2000; Luster and Small 1997a; Saewyc, Magee and Pettingell 2004; Silverman et al. 2001; Stock et al. 1997). Thus examining the potential influence of other victimization is important for disentangling the consequences of sexual victimization.

In sum, there is a great need for attention to the contextual details surrounding an episode/experience of sexual victimization, because such details have import for the risks and consequences. Failing to account for these variations/distinctions between experiences/contexts weakens our understanding of the experiences as a whole, blurs the distinctions between individuals, and may obscure important relationships between sexual victimization and consequences. Careful consideration should be given to the purposes for obtaining specific information from respondents. Asking **why** we want to know about a respondent's number of sexual partners may help to illuminate the way it should be asked. Asking what kinds of sexual victimization experiences we want to investigate—interfamilial victimization, date rape, anything the respondent considers victimization—will help to determine how the questions should be asked and where they should be placed within the survey questionnaire.

In this section, I have discussed some of the more significant shortcomings of previous work on sexual victimization, those that undermine the validity of the findings and limit our understanding of its causes, predictors, and consequences. In the following section, I note problems found in the analysis of survey data on sexual victimization, including the way that race/ethnicity is addressed, the failure to address issues of right-censoring or possibly confounding variables, and the failure to note how data limitations may influence findings.

V. SHORTCOMINGS IN ANALYSIS

Another set of issues arises at the analysis phase of empirical research. Some of these are related, of course, to data collection, as analysis is constrained by the data available to be

analyzed. However, others are decisions made by the authors themselves about how to analyze the data and what to exclude from consideration.

K. RACE/ETHNICITY

The previous section discussed the lack of racial/ethnic diversity in samples used to study sexual victimization; this general inattention to issues of diversity extends to the analysis phase of many studies as well. Many studies simply include race/ethnicity as an independent variable in the analysis in an effort to "control" for its effects (Berenson, Wiemann and McCombs 2001; Boney-McCoy and Finkelhor 1995; Cherlin et al. 2004; Dietz et al. 1999; Felitti et al. 1998; Hillis et al. 2000; Raj, Silverman and Amaro 2000; Silverman et al. 2001; Williamson et al. 2002; Wonderlich et al. 1996). However, rarely is it clear **why** race/ethnicity is included in the analysis. Is it a proxy for socioeconomic status? For "culture"? A proxy for other, unmeasured characteristics? Moreover, few discuss the analytical results with more than a sentence or two, regardless of whether the variable was statistically significant. Only a small subset of studies estimates models separately by race/ethnicity (e.g., Kenney, Reinholtz and Angelini 1997; Roosa et al. 1997) to investigate whether there are different effects of the other control variables by race/ethnicity, but not all of these include a rationale for doing so.

While studies that control for race/ethnicity make a somewhat larger contribution to our understanding of sexual victimization than those that do not (Campbell et al. 2002; Nagy 2000; Noll, Trickett and Putnam 2003; Rainey, Stevens-Simon and Kaplan 1995; Stock et al. 1997; Wise et al. 2001), the lack of attention to the matter in the literature as a whole is striking. Without attention to why race/ethnicity is included or why separate models are estimated by race/ethnic group, and without discussion of the implications of the results, such research essentializes race as a causal variable and obscures other important pathways through which the risk of sexual victimization or its consequences is influenced. It is here as well where sociologists could contribute to the literature, bringing to bear the vast body of research on race/ethnicity and structural inequality and helping to elaborate on why the prevalence and consequences of sexual victimization might vary by race—or what it may mean if they do not.

L. RIGHT-CENSORING

The subset of studies examining links between sexual victimization and adolescent pregnancy suffers from an additional analytical problem; they have not addressed the issue of right-censoring (Adams and East 1999; Fergusson, Horwood and Lynskey 1997; Jewkes et al. 2001; Nagy, DiClemente and Adcock 1995; Rainey, Stevens-Simon and Kaplan 1995; Silverman et al. 2001; Smith 1996; Stock et al. 1997; Zierler et al. 1991). That is, many studies have examined the risk of adolescent pregnancy among respondents who are still adolescents and could still go on to have an adolescent pregnancy after the survey. Failing to account for this possibility in the analysis can lead to an underestimation of the overall risk of adolescent pregnancy and can lead to erroneous conclusions about the relationship between the two phenomena. Although many surveys do not gather the kinds of data needed to address this issue (e.g., date information for the pregnancy and sexual victimization episodes), the lack of attention to right-censoring in the analysis undermines the validity of the results. At a minimum, this limitation must be acknowledged, as it could have considerable bearing on the conclusions.

M. CONFOUNDING VARIABLES

Most studies on the topic have also failed to control for potentially confounding variables, like socioeconomic status, family structure, or education, which may be associated with both sexual victimization and the consequences often under examination (Boyer and Fine 1992; Chandy, Blum and Resnick 1996; Kenney, Reinholtz and Angelini 1997; Nagy, DiClemente and Adcock 1995; Stock et al. 1997; Zierler et al. 1991). For example, sexual victimization and having multiple sexual partners have both been found to be negatively associated with family socioeconomic status (Hallman 2004; Stark and Flitcraft 1996). Without including a measure of socioeconomic status in the analysis, for example, one cannot rule out the possibility that an observed relationship between sexual victimization and having multiple sexual partners is spurious. Failing to control for confounding variables complicates the already complicated task of identifying clear and consistent relationships between sexual victimization and various outcomes—or ruling them out.

Attempting to control for potentially confounding variables in the analysis does sometimes present difficulty. First, variables that a researcher may want to include, such as parental education attainment and family socioeconomic status, may be highly correlated with one another, precluding the inclusion of both measures in the same statistical models. Second, it is sometimes it is a difficult issue to determine which variables should be collected in this regard and how they should be measured. For example, when measuring the effects of childhood victimization in a retrospective study of victimized adults, should the analysis include the respondent's current socioeconomic status or his/her socioeconomic status during childhood? If the latter, how should it be measured given that adults may not recall their childhood circumstances accurately? Nevertheless, confounding variables must be given serious consideration in future research.

N. OTHER VICTIMIZATION EXPERIENCES

The final shortcoming of analytical work on sexual victimization pertains to respondents' other experiences with victimization; these can be considered a type of confounding variable, but one with particular implications because different types of victimization tend to co-occur (Pallitto and O'Campo 2004). As noted above, not all studies collect information on more than one episode of sexual victimization or on respondents' experiences with other types of victimization, such as neglect or psychological abuse. However, even among the subset that did collect such information (Berenson, Wiemann and McCombs 2001; Boney-McCoy and Finkelhor 1995; Dietz et al. 1999; Felitti et al. 1998; Luster and Small 1997a; Rodgers et al. 2004; Silverman et al. 2001; Smith 1996; Welch and Fairburn 1996), it has not often been used to great advantage. Most of the studies with data on more than one type of victimization simply estimated separate models for each type of victimization without controlling for the occurrence of the other types. For example, Dietz and colleagues (1999) examined the association of psychological abuse, physical abuse, peer sexual assault, and childhood victimization with unintended pregnancy but estimated a model for peer sexual assault without controlling for the respondents' experiences with physical abuse or the other types of abuse. Consequently, they cannot determine whether peer sexual assault has an

independent effect on unintended pregnancy. Only a few of the studies controlled for other types of victimization when examining the consequences of sexual victimization (Cherlin et al. 2004; Williamson et al. 2002). Without such controls, we cannot determine from these studies how much (if any) influence sexual victimization had on the outcomes in question.

In this section, I described several shortcomings in the analysis of data on sexual victimization that undermine the strength and validity of research findings. Coupled with the limitations detailed in Section IV concerning survey design and implementation, it is clear that more careful work on this topic is needed.

VI. CONCLUSIONS

Sexual victimization affects millions of girls and women around the world each year and many suffer long-term and considerable consequences from their experiences. Their experiences may also affect their family members; depression or other mental health problems stemming from the victimization may impede intimate relationships with family members, reduce victims' ability to contribute economically to their households, and may increase her likelihood of suicide. In 1994, researchers for the World Bank found that rape and domestic violence are responsible for the loss of more disability-adjusted life years among women of reproductive age than cancer is and almost as many as heart disease is (Heise, Paitanguy and Germain 1994). They suggest that it represents a significant obstacle to economic and social development by sapping women's energy, undermining their confidence, and compromising their health.

Research on sexual victimization has become increasingly common in recent years as the epidemic of Human Immunodeficiency Virus (HIV) has spread and matured around the world. Some research has made it clear that sexual victimization is related to the risk of acquiring HIV and that understanding how it shapes the interactions between sexual partners can have important ramifications for the individuals involved and the scale of the

epidemic in a given setting (García Moreno and Watts 2000). This may be particularly true in South Africa, where the HIV epidemic is considered mature and the prevalence of sexual victimization is so high, and in countries like India where sexual victimization is common and HIV is crossing over from "bridge" populations (e.g., sex workers) to the general population (Narain et al. 1994). Gaining insight into factors that increase the risk of experiencing it and exacerbate or ameliorate the consequences may shape the health and wellbeing of survivors of sexual victimization, their families, and society at large.

The main purposes of this critique were to identify obstacles to the accumulation of knowledge about the causes and consequences of sexual victimization, and to identify methodological limitations in the research conducted to date that undermine the validity of the findings. Survey methods have been widely used to study sexual victimization in many disciplines; large-scale population-based surveys are especially useful in determining estimates of prevalence and the magnitude of consequences in a population, and smaller surveys are useful for gathering information from respondents efficiently and in a standardized manner. Both types of surveys offer a way to gather important information on sexual victimization and its associated outcomes. However, their design, implementation, and analysis have not always addressed key methodological concerns. The shortcomings addressed in this critique have sometimes stemmed from funding and/or other resource constraints that limit the amount of data that is possible to gather. Surveys, and especially large-scale surveys, are often developed to serve many purposes or face other constraints in the field, such as interviewer or respondent fatigue, that make the collection of sufficiently detailed information infeasible. Consequently, the number of questions included on a survey about a given topic is often reduced below the number required to produce more defensible results. However, even in these cases, it is critical to recognize and acknowledge the shortcomings of the studies explicitly and consider how these limitations may limit the research findings. Surprisingly few of the studies I reviewed for this critique acknowledged important limitations of the work.

An implicit purpose of this critique was to foster inter-disciplinary awareness of the research efforts on sexual victimization. Although scholars in psychology, psychiatry,

social work, sociology, family studies, criminology, medicine, and public health have all conducted research on sexual victimization, there has been a surprising lack of crossover among the disciplines. The findings are often published in journals specific to one discipline and apparently rarely accessed by scholars in other disciplines. The published literature reviews on the topic are equally limited in their disciplinary breadth, generally focusing on just one or perhaps two disciplines. Consequently, in spite of many decades of research on the topic, there has been less accumulation of knowledge than one would expect given the amount of attention this topic has received within each discipline.

Future survey research on sexual victimization could benefit from the involvement of scholars from many different disciplines to address the weaknesses found in the literature and draw upon the strengths of each discipline. Studies conducted by psychologists and social workers often include detailed questionnaires or diagnostic modules to determine the sexual victimization history of a respondent. Because of the many different forms that victimization can take and the importance of duration, severity, and the age of the victim and his/her relationship to the perpetrators in determining the severity of the consequences, this level of detail is important. However, these results of these studies are often not generalizable to larger populations because of small sample sizes or other methodological limitations, and often lack information on more social structural variables that may also influence the findings.

Quantitative sociologists and social demographers, on the other hand, often conduct studies containing large enough sample sizes and addressing many (though certainly not all) of the methodological flaws that would prevent the generalization of the findings and often gather considerable information on background social structural variables. However, they are usually not interested specifically in the consequences of sexual victimization. Consequently, these studies do not contain sufficient detail about sexual victimization experience itself, and thus cannot support the nuanced analysis that the smaller psychological studies can. Future efforts to understand the causes and consequences of sexual victimization of any type should capitalize on the strengths of each discipline to address the existing shortcomings in the literature.

Sociologists and social demographers could also add to the study of sexual victimization in a number of ways. One of the major shortcomings I identified in this critique was the inattention to racial and ethnic diversity in the design and analysis of surveys on this topic. Because of the potential for racial and ethnic minority groups to experience more sexual victimization and experience more severe consequences, the sociological perspective—with its attendant focus on social structure and structural inequality—could add much to the literature. In addition, given the role that gender may play in the causes of sexual victimization and in the lack of attention that sexual victimization has received in prevention efforts relative to other forms of victimization (e.g., drug-related crime), it is surprising that more sociologists have not focused on sexual victimization. In turn, the possibility that the trauma of experiencing sexual victimization could contribute to reduced health, educational attainment, employment prospects, or the persistence of other social inequalities suggests that sociologists should place the study of sexual victimization higher on their research agenda.

In sum, this critique has identified some key weaknesses in the literature on sexual victimization. Not only have these shortcomings slowed the accumulation of knowledge about the topic, but they may have hampered policy and program efforts to prevent sexual victimization and attenuate its consequences. There is much to be gained from addressing these limitations in future research.

CHAPTER 5

CONCLUSION

This dissertation has explored different aspects of trauma and disruption. The two empirical articles investigated the potential influences of experiencing sexual victimization or household economic and contextual shocks on the sexual and reproductive behavior of young South Africans. The third identified important limitations in the body of literature investigating the causes and consequences of sexual victimization.

The three articles share a number of themes and characteristics. First, all three articles share an interdisciplinary focus, drawing upon theory and empirical research from multiple disciplines and demonstrating what might be gained from such an approach. The article on sexual victimization and adolescent pregnancy improved upon research conducted in psychology, psychiatry, social work, sociology and social demography, family studies, criminology, medicine, and public health and relies on tools and theories from sociology and demography to do so. The methodological critique of the sexual victimization literature evaluated research from these same disciplines and drew upon sociology and demography to identify ways that future research could be improved. The household shocks article draws upon theory and research from economics, psychology, sociology, and public health to investigate the potential influences of household economic and contextual changes on sexual risk-taking behavior.

Although it would be unproductive to encourage scholars to identify a single best way to investigate the topics examined in this dissertation, the interdisciplinary focus of all three articles helped to identify specific improvements that would help to advance future research efforts on the topics addressed in this dissertation.

With respect to experiencing household disruptions, the bulk of the theories and related empirical research suggests that experiences of household shocks **should** influence young people's sexual behavior for a number of possible reasons. The lack of significant findings in my article on household disruption indicates either that the theories need further elaboration or increased specificity or that the data are insufficient to answer the research questions I posed. Although I cannot adjudicate definitively between these explanations, I am inclined to believe that data limitations explain the lack of significant results. Simply put, the data may not have captured the many possible disruptions and other influences that could occur in the lives of young people and could influence young people as much if not more than the disruptions that were measured. Moreover, the data do not contain information to measure the magnitude of the impact that the shocks may have had on the young person, or even on the household as a whole. That, coupled with the possibility that the impact of a given shock could have been positive or negative depending on the context or that the shock could have had **both** positive and negative impacts in the same household, may limit the predictive power of the measures used here. The Cape Area Panel Study, which adapted the questionnaire used in the Durban Transitions study and added questions about the perceived financial impact of each disruption on the household, has made an important step forward in improving the measures (Lam, Seekings and et al. 2005). However, many of the disruptions examined in this article and by both surveys could have impacts that go beyond financial; the death of a parent or grandparent, for example, could cause significant psychological distress. In light of a vast body of literature supporting the influences of psychological distress on subsequent behavior, other types of impact should also be measured. Moreover, Bronfenbrenner's ecological framework (1979; 1986) suggests that disruptions in other life domains, such as school, peer relationships, romantic relationships, may also influence young people's wellbeing in important ways. Future surveys should collect more information about disruptions in numerous life domains, including school, work, family, friendships and romantic relationships, and collect more information about the many possible impacts those disruptions could have. Given the pace of social change in developing country settings around the world, change and disruption in many domains may be the norm rather than the exception. Thus it is important that our conceptual

models—and thus our surveys—capture the many sources of change occurring in the lives of our survey respondents.

The two articles on sexual victimization, the methodological critique and the empirical article on sexual victimization and adolescent pregnancy, also pinpoint numerous improvements needed to build upon the vast body of literature published to date. Increased attention to racial/ethnic diversity in sampling and analysis, the incorporation of best practices for survey research into future surveys, and careful consideration of the types and amounts of information collected in surveys would do much to improve our understanding of sexual victimization.

In particular, increased attention to racial and ethnic diversity is critical to make our understanding of the causes and consequences of sexual victimization more complete. However, while research examining variations in prevalence or consequences by racial or ethnic groups is an important first step toward documenting sexual victimization more inclusively, studies that merely "control" for race overlook an important opportunity to gain theoretical insight. If prevalence patterns differ for one racial group compared to another, for example, or if theoretical explanations for behavior changes after sexual victimization seem to apply better to some groups than others, exploring why this may be the case provides an opportunity to discover limitations of existing theories and to suggest alternatives. Thus these subgroup variations have the potential to be theoretically and programmatically informative. Yet it is also important to recall the intersectionality of different social categories (McCall 2001; McCall 2005)[14]; intersections between race, socioeconomic class, gender, geographic location, and other social categories may have important implications in the study of sexual victimization.

In addition, the methodological critique highlighted the need for increased standardization of the information collected on sexual victimization and its hypothesized consequences. Although it is critical to adjust survey questions to make them as meaningful to the survey respondents as possible, it is also helpful to ensure, to the extent

[14] I am indebted to Emily Greenman for this insight and these references.

possible and appropriate, that the data are comparable to data collected previously. While of course researchers do not always have control over the data that are collected and resources often constrain the amount of information that can be obtained in a survey, at a minimum, scholars should consider the possibility of replicating or adapting previous work or using a previously validated instrument before creating an entirely new set of questions. This requires a fine balance with the requirements of the context, but it is important to aid in the accumulation of knowledge about the subject. In sum, the articles on sexual victimization provide strong evidence that much work on this topic remains. Understanding the causes and consequences of sexual victimization must remain a central task for researchers in many disciplines in the coming years.

The persistence of sexual victimization and sexual risk-taking behavior among people around the world, in spite of decades of research and prevention efforts, suggests that new avenues of research and programming and improvements to previous efforts are needed. Survey research must become more complex to better capture the reality of individual life courses; only then will we be able to draw meaningful conclusions—and more importantly, identify and reach out to vulnerable populations more effectively and efficiently. The articles in this dissertation provide some direction for these efforts.

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