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Neighborhood Environment and Intimate Partner Violence: a systematic review

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Abstract

Intimate partner violence (IPV) is an important global public health problem, affecting women across the lifespan and increasing risk for a number of unfavorable health outcomes. Typically conceptualized as a private form of violence, most research has focused on individual-level risk markers. Recently, more scholarly attention has been paid to the role that the residential neighborhood environment may play in influencing the occurrence of IPV. With research accumulating since the 1990s, increasing prominence of the topic, and no comprehensive literature reviews yet undertaken, it is time to take stock of what is known, what remains unknown, and the methods and concepts investigators have considered. In this paper, we undertake a comprehensive, systematic review of the literature to date on the relationship between neighborhood environment and IPV, asking: “What is the status of scholarship related to the association between neighborhood environment and IPV occurrence?” Although the literature is young, it is receiving increasing attention from researchers in sociology, public health, criminology, and other fields. Obvious gaps in the literature include limited consideration of non-urban areas, limited theoretical motivation, and limited consideration of the range of potential contributors to environmental effects on IPV – such as built environmental factors or access to services. In addition, explanations of the pathways by which place influences the occurrence of IPV draw mainly from social disorganization theory, which was developed in urban settings in the United States and may need to be adapted, especially to be useful in explaining residential environmental correlates of IPV in rural or non-US settings. A more complete theoretical understanding of the relationship between neighborhood environment and IPV, especially considering differences among urban, semi-urban and rural settings, and developed and developing country settings, will be necessary to advance research questions and improve policy and intervention responses to reduce the burden of IPV.

Introduction

Intimate partner violence (IPV) is an important global public health problem, affecting women across the lifespan and increasing risk for a number of unfavorable health outcomes, including chronic pain, depression and other mental health problems, adverse birth outcomes, and death (Carmen, Rieker, & Mills, 1984; Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; Haber, 1985; L. Heise, Ellsberg, & Gottmoeller, 2002; Krug, Mercy, Dahlberg, & Zwi, 2002; Saltzman, Johnson, Gilbert, & Goodwin, 2003; Watts & Zimmerman, 2002). The Centers for Disease Control and Prevention (CDC) in the US has noted that IPV includes “physical violence, sexual violence, threats of physical or sexual violence, stalking and psychological aggression (including coercive tactics) by a current or former intimate partner” (Black et al. 2011).

Recent CDC data indicate that about 36% of women and 29% of men in the US have experienced rape, physical violence, or stalking by an intimate partner in their lifetime, and nearly half of all women and men have experienced psychological battering by an intimate partner in their lifetime (CDC, 2011). When asked about the prior year, about 6% of women and 5% of men said they were raped, physically assaulted, and/or stalked by an intimate partner (CDC, 2011). Rates of violence are known to vary among racial and ethnic groups (Cunradi, Caetano, Clark, & Schafer, 2000; Jones et al., 1999), and by geography (Alhabib, Nur, & Jones, 2010; Kramer, Lorenzon, & Mueller, 2004; Lanier & Maume, 2009; Peek-Asa et al., 2011). Rates are also known to vary in sub-populations, including women seeking abortions (Saftlas et al., 2010).

Typically conceptualized as a private form of violence, most research to date has focused on individual-level correlates, such as age, length of relationship and prior history of abuse. Recently, more scholarly attention has been paid to the role that the residential environment – often described as the neighborhood environment – may play in influencing IPV. Studies that attempt to untangle individual and environmental determinants of IPV are nested within a larger body of work that examines residential environmental influences on a wider range of health topics. Research has shown that residential environmental characteristics are related to a number of health behaviors and outcomes, including cancer screening, cardiovascular disease, and violence, and researchers increasingly recognize the need to focus beyond individual risk for disease by considering the physical and environmental contexts as potential determinants of outcomes (Diez Roux, 2001; Diez Roux, 2003, 2009; Kawachi & Berkman, 2003; O'Campo, 2003; Pruitt, Shim, Mullen, Vernon, & Amick, 2009).

Closely related to the study of IPV is the study of child maltreatment (CM) – a field in which neighborhood and community environments were explored earlier. In the 1970s, Garbarino began to posit relationships between community and child maltreatment, suggesting that communities impart risk and protective factors that may impact prevalence of child abuse and neglect (Garbarino & Crouter, 1978). In the late 1990s, Coulton, Korbin and colleagues began applying multilevel analytic methods to the study of neighborhood factors associated with child maltreatment. When Coulton and colleagues published a literature review of child abuse and neighborhood determinants in 2007, they found 25

studies that examined the relationship between geographically defined spatial areas and child maltreatment (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007). Research examining the relationship between residential environment and IPV has been slower to develop than the related child maltreatment literature and far less prolific than the literature on the relationship between neighborhood of residence and other health outcomes.

In 1998, Lori Heise proposed a social-ecological model relating both social and residential environmental characteristics to violence against women (Heise, 1998), which provides a useful conceptual model in guiding research in this area. In addition, a small number of studies have identified spatial patterning in the incidence of IPV and intimate partner homicide (Madkour, Martin, Halpern, & Schoenbach, 2010; Miles-Doan, 1998; Miles-Doan & Kelly, 1997), and research has moved toward disentangling compositional (e.g., demographic) from contextual (e.g., structural, experiential) factors to explain spatial patterns of IPV. Figure 1 is a conceptual model that draws upon previous work to depict the social-ecological relationships involved in shaping the likelihood of IPV occurrence (Bronfenbrenner, 1979; Heise, 1998; Stith et al. 2004; Dutton 2009). Our focus in this paper is on neighborhood- and community-level influences.

We are not aware of any other reviews of the literature on the relationship between neighborhoods and intimate partner violence. With research accumulating since the 1990s, increasing prominence of the topic (Linos & Kawachi, 2012), and the potential to identify promising neighborhood-level targets for policy change and program development, it makes sense to take stock of what is known, what remains unknown, and methods and concepts considered. In this paper, we undertake a comprehensive, systematic review of the literature to date on the relationship between the residential environment and IPV, asking specifically: “What is the status of scholarship related to the association between residential environment and IPV occurrence?” Further sub-questions include: “What are the primary hypotheses tested?” “What research methods are used to satisfy conditions of ecologic levels?” “What is the theoretical basis for extant research?” We conclude with a summary of the hypothesized pathways by which neighborhood environment influences IPV occurrence and discuss implications for research, policy and practice.

Approach

Search strategy

We undertook a review of work published in English on the subject of residential environment and IPV. Figure 2 shows our search strategy, presented according to PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). Our inclusion criteria were: peer-reviewed papers, published in English, which explicitly examined the role of neighborhood environment in influencing IPV by statistically modeling the association between neighborhood environment and IPV, while controlling for individual-level factors. We limited our search to 1995 to the present, as an article published in 1995 (O'Campo et al., 1995) has been identified as the first publication on this subject, examining both individual and contextual factors related to IPV (Cunradi, et al., 2000; Pearlman, et al., 2003). The publication date of this paper thus provides an intuitive search limit and is preferable to the selection of an arbitrary date. We conducted our search in both PubMed and Scopus because

of their relative strengths in the biomedical and social sciences. We confirmed that the combination of these databases provided significant coverage of our target papers by verifying that our search identified key papers in the field, with which we were already familiar. Our search terms, implemented on February 11, 2012, are: (community OR communities OR “residence characteristics” OR residence OR rural* OR “rural population” OR environment* OR “social environment” OR context OR neighborhood* OR place OR geogr*) AND (“domestic violence” OR “battered women” OR “spouse abuse” OR “partner violence” OR “domestic abuse” OR “partner abuse”) AND (“statistical regression” OR “statistical analysis” OR “regression analysis” OR “statistical model* ” OR regression* OR correlation OR analysis OR predict OR statistics OR “significant association” OR “significantly associated” OR “multilevel model* ” OR “analyze data” OR “risk factor* ”)

Limits: English, Publication Date from 1995 to 2012. Our search retrieved 1751 records in PubMed and 2277 in Scopus. We identified 7 additional articles through other means (personal collections) that were missed by our search, for a total of 4035 articles. We removed 1331 duplicate references, for a total of 2704 records to be screened at title review, to narrow the set of articles for relevance to our research question.

Screening and review process

To reduce our list efficiently, we scanned the titles to identify possible keywords to assist in exclusion. All titles with the keywords selected were then individually scanned and removed if they fell outside the scope of this review. Keywords identified included HIV (250 reviewed, 230 removed using this keyword) children (551 reviewed, 530 removed), Elder (42 reviewed, 40 removed), screen (244 reviewed, 238 removed), drug (147 reviewed, 130 removed) intervention (314 reviewed, 288 removed), tobacco (8 reviewed, 6 removed), belief (46 reviewed, 42 removed), qualitative (116 reviewed, 113 removed), abortion (19 reviewed, 19 removed), suicide (43 reviewed, 43 removed), childhood (101 reviewed, 93 removed), depression (75 reviewed, 75 removed), child (177 reviewed, 148 removed), program (115 reviewed, 95 removed). The remaining records were examined and additional records were removed, for a total of 120 records remaining after title review.

We then reviewed the abstracts of these papers to examine their relevance for our question. Two raters (authors 1 and 2) reviewed each abstract and indicated whether the article should be retained or not. With this initial independent rating, one rater sought to retain 53 articles and the other to retain 49, for an agreement of 73%. After discussion, this agreement moved to 94%, with one rater seeking to retain 46 articles and the other to retain 45. A total of 54 articles, encompassing all those marked to be retained by either rater (rater selections did not entirely overlap), were examined at full text review.

After full text review, 18 were eliminated because they did not meet our criteria, primarily because they did not control for individual-level predictors or specified an outcome that did not directly measure IPV occurrence (victimization or perpetration). Additional reasons for exclusion are displayed in Figure 2. Our review includes a total of 36 papers published between 1995 and February 11, 2012.

Tabulation of findings

The following information was abstracted and tabulated for each article and is presented in Table 1: author(s)/year, location/setting, study design/data source(s), population, outcome(s) of interest, covariates considered, predictor(s) of interest, analytic approach and results. We also summarized strengths and weaknesses of each article, with a focus on analytical approach and theoretical or conceptual motivation, which we consider to be critical in identifying eventual targets and approaches for intervention to reduce violence. In the sections below, we examine in more detail and synthesize the information presented in Table 1.

Results

Historical development

Efforts to disentangle individual from neighborhood effects on IPV began in the mid 1990's and have increased in recent years. Figure 3 illustrates the increase in interest as observed in the peer-reviewed literature we include in our review. The earliest studies on the relationship between neighborhood environment and IPV were undertaken in the US, and the preponderance of work still originates there. O'Campo (1995), an epidemiologist, led the first study that sought to measure both individual- and macro-level variables that may be associated with IPV, investigating the occurrence of IPV during the childbearing year. While controlling for individual-level variables such as age and marital status that are known to influence IPV, they found a significant effect at the Census Tract level, with both unemployment and per capita income associated with increased occurrence (O'Campo, et al., 1995). Other researchers have continued this line of inquiry, expanding the range of variables considered, exploring additional study areas, deepening the complexity of analysis, and increasing the range of study findings.

Study areas

The vast majority of studies on this topic have taken place in the US and have drawn largely on social disorganization theory. Many of these studies come from the disciplines of sociology and criminal justice, with the field of epidemiology providing increasing influence. As shown in Table 1, of the 36 studies reviewed here, 11 (31%) were national US studies and 11 (31%) were smaller scale US studies, focusing mostly on particular US municipalities. Some recent work has begun to explore the relationship between neighborhood/community conditions and IPV occurrence in the context of developing countries, with a significantly more pronounced focus on the importance of social norms. Of those non-US studies, four were set in India (11%), four in Bangladesh (11%), two in Nigeria (6%) and one was set in each of the following countries: Canada, Columbia, Ethiopia and Peru. Of the 11 sub-national US studies, 9 focused decidedly on urban areas (e.g., Chicago, New York), and none focused specifically on rural areas. Notably, no studies identified were set in Europe, the Middle East, Australia or China, although it is possible that some publications could have been missed in the search if they were not published in English or in a peer-reviewed journal.

Study design, populations, and data sources

All studies reviewed here are cross-sectional in nature and can only quantify associations, not causality, between variables. A small number of studies made use of datasets with longitudinal components (Benson, Fox, DeMaris, & van Wyk, 2003; DeMaris, Benson, Fox, Hill, & Van Wyk, 2003; Van Wyk, Benson, Fox, & DeMaris, 2003). Populations include men, women, pregnant women, and couples. Many studies relied on large, existing databases, including population-based surveys, police records, temporary aid to needy families (TANF), or existing research study databases.

Outcomes and covariates

Most studies used a measure of physical IPV as an outcome, with the vast majority using a version or adaptation of the Conflict Tactics Scale. In addition, 13 studies examined sexual violence and only three examined psychological/emotional violence. The larger focus was on male to female violence, although several studies considered mutual IPV or both male to female and female to male IPV. IPV occurrence was measured primarily as self-reported victimization and secondarily as self-reported perpetration. The covariates included a range of socio-demographic variables often considered, such as race, ethnicity, education, income, and marital status. In addition, a wide range of additional variables were considered, including measures of social support, partner use of drugs or alcohol, and the presence of young children. In several instances, interesting and not often considered variables such as “jealousy as a source of conflict, subjective financial satisfaction, and intergenerational exposure to violence were included. Overall, the studies reviewed exhibited wide variability in factors examined and controlled.

Neighborhood predictors

Neighborhood predictors of interest examined in the studies reviewed can be divided into several categories, as shown in Table 2. Many studies have examined basic socioeconomic or demographic information at the neighborhood level, and have been dependent on censuses or large population surveys for determination of these area-level variables. US Census indicators include unemployment, working class employment, under-education, poverty, single-parent families, non-white race, and reliance upon public assistance (see Table 2). Outside of the US, basic measures of human and economic development (e.g., income and education) have also been used (Ackerson, Kawachi, Barbeau, & Subramanian, 2008; Ackerson & Subramanian, 2008; Koenig, Ahmed, Stephenson, Jejeebhoy, & Campbell, 2006).

Informed by social disorganization theory, measures of concentrated disadvantage and residential mobility, derived from Census data, have been used on numerous occasions. A number of researchers have used factor analysis or principal components analysis to construct indices of deprivation using Census data, which are then used to estimate neighborhood-level disadvantage. A smaller number of studies, particularly those using surveys and sub-national study areas, have attempted to directly measure social disorganization theory constructs such as collective efficacy (Browning, 2002; Dekeseredy, Schwartz, Alvi, & Tomaszewski, 2003), social cohesion (Frye et al., 2008), non-intervention

norms (Browning, 2002), and social or physical disorder (Cunradi, 2007; Cunradi, 2009; Dekeseredy, et al., 2003; Frye, et al., 2008; Raghavan, Mennerich, Sexton, & James, 2006).

Some have used police or other crime data to quantify levels of community violence (Koenig et al., 2006; Li et al., 2010), and others have measured perceived levels of violence or personal exposure (Dekeseredy, et al., 2003; Raghavan, et al., 2006; Reed et al., 2009; Stueve & O'Donnell, 2008). A small number of studies have directly measured the level of IPV, either by asking about self-reported violence, including IPV, in a person's social network (Raghavan, Mennerich, Sexton, & James, 2006; Raghavan, Rajah, Gentile, Collado, & Kavanagh, 2009) or measuring community prevalence of violence or attitudes supporting violent behavior (Koenig, et al., 2006; McQuestion, 2003).

Primarily outside of the US, measures of women's empowerment have been explored, including proportion of women in savings/credit groups (Koenig, Ahmed, Hossain, & Khorshed Alam Mozumder, 2003), women's autonomy (Koenig, et al., 2003), female education and literacy (Ackerson, et al., 2008; M.H. Boyle, Katholiki Georgiades, Cullen, & Racine, 2009; Koenig, et al., 2003; Koenig, et al., 2006), gender norms (Koenig, et al., 2006), and gender equality (Ackerson & Subramanian, 2008); interestingly, measures of women's empowerment at the neighborhood level have not been used frequently in studies in the US. Three final categories have received surprisingly little attention: the differences between urban and rural areas (Flake, 2005; Lauritsen & Schaum, 2004), regional differences within study areas (Flake, 2005; Koenig, et al., 2003), and the density of particular structures that might indicate other risky behavior, such as drug markets or alcohol outlets (McKinney, Caetano, Harris, & Ebama, 2009).

Neighborhood definitions

Studies reviewed here used both geographical definitions of neighborhoods or communities, as well as individually reported neighborhood characteristics. Issues associated with neighborhood definition have been acknowledged and discussed in the literature (Flowerdew, Manley, & Sabel, 2008). Most US-based analyses that defined geographic neighborhoods used the Census Tract as a proxy for neighborhood (n=11). Other US neighborhood definitions included city-defined neighborhoods (n=2), ZIP codes (n=1) and census blocks (n=1). Surprisingly, despite the fact that Census Block Groups are smaller units than Census Tracts, for which socioeconomic information is available, no studies reviewed here used the US Census Block Group. Overall, eight studies used individual reports of neighborhood characteristics, and three were defined only by participants' selection of urban versus rural residence. One study, based in Peru, focused on larger *regions* of residence within the country. Often, studies relying on survey data used the primary sampling units associated with the survey (n=7), which were typically described as being relatively small areas. Two papers by the same author defined one urban and one rural region in Bangladesh, and defined "neighborhoods" differently for each region, focusing on *mohollas* (a community within a village or town) in the urban region and villages in the rural region (Naved & Persson, 2005, 2008).

Analytic approaches

Slightly over half of the papers reviewed accounted for ecological levels in the analytical approach, using multilevel modeling (15, 42%) or adjusting for clustering using survey weights (4, 11%), often with 2-4 levels, to facilitate examination of variance at multiple levels of influence. These approaches allowed researchers to adjust for clustering of individuals within neighborhoods and to address the problem of confounding compositional effects (i.e., everyone in the neighborhood is poor, so their combined risk is higher) with contextual effects (i.e., above and beyond being individually poor, neighborhood poverty affects risk). Many other researchers, due to data structures and other considerations, have used standard logistic regression modeling (13, 36%). One paper modeled time to re-victimization using survival analysis (Mears, Carlson, Holden, & Harris, 2001), one used path analysis (Caetano, Ramisetty-Mikler, & Harris, 2009), and two very recent papers made use of structural equation modeling (Uthman, Moradi, & Lawoko, 2011; Waller et al., 2011).

Findings

Main findings from our review are displayed in Table 2, which summarizes the results of studies of neighborhood environment and IPV by construct examined, grouped into domains of influence. Our analysis found that, of the 36 studies examined, 30 reported some evidence that neighborhood-level factors are associated with physical and/or sexual IPV. Community- or neighborhood-level indicators most frequently associated with IPV included measures related to community socioeconomic (e.g., unemployment rate, per capita income, poverty rate, education, etc.) (n=11). All of these studies were set in the US and used Census indicators; three of these studies used an index to combine Census indicators theorized to comprise the construct of neighborhood disadvantage. Four studies examined neighborhood social disorder and/or collective efficacy, applying the work of Sampson, et al. (1997) to IPV. In contrast to US studies, those conducted in India and Bangladesh reported associations between such social indicators as community norms regarding violence, community attitudes towards women, women's literacy and education, and murder rates.

Over and above what would be expected based on individual-level factors, individuals living in neighborhoods and communities with high unemployment (O'Campo, et al., 1995), low average incomes (Mears, et al., 2001; O'Campo, et al., 1995), higher proportions of female-headed households (Lauritsen & Schaum, 2004) and higher proportions of households with children (Lauritsen & Schaum, 2004) have been found to be at increased risk of IPV. Less evidence has been found to support the notion that neighborhoods with lower owner occupancy, lower neighborhood wealth, higher proportions of non-white residents, lower educational or occupational attainment, more vacant housing, or higher immigrant concentrations are associated with IPV occurrence. No evidence has been found to support the idea that levels of human and economic development, largely within developing countries, are associated with IPV occurrence. Lower male literacy rates, however, have been associated with increased IPV (Ackerson, et al., 2008).

Results of the investigations of the relationship between neighborhood disadvantage and IPV have been mixed, with a number of researchers reporting significant associations

(Benson, et al., 2003; Benson, Wooldredge, Thistlethwaite, & Fox, 2004; O'Campo, et al., 1995), some reporting non-significant effects (Li, et al., 2010), and others reporting differential effects for different races/ethnicities (Cunradi, et al., 2000) or confounding effects between race and neighborhood-level disadvantage (Benson, et al., 2004; Van Wyk, Benson, Fox, & DeMaris, 2003). Residential stability, traditionally hypothesized to have a strengthening effect on neighborhoods that could reduce rates of violent crime, has been found instead to be associated with increased IPV (Benson, et al., 2003; Li, et al., 2010; Waller, et al., 2011), or to have no association (Browning, 2002; Waller, et al., 2011). This has led researchers to question the meaning of residential instability in an age when it may be associated with higher levels of education and mobility; some have suggested that residential stability, in concert with neighborhood disadvantage, could in fact prolong and deepen one's experience of disadvantage, thereby increasing the likelihood of occurrence. Lower levels of collective efficacy (Browning, 2002; Dekeseredy, et al., 2003), lower levels of social cohesion (Obasaju, Palin, Jacobs, Anderson, & Kaslow, 2009), stronger norms of nonintervention (Browning, 2002), and higher perceived neighborhood disorder (Cunradi, 2007; Cunradi, 2009) – more direct measures of social disorganization – have been found to be associated with increased IPV. Interestingly, a recent study linked neighborhood levels of legal cynicism – anomie with respect to law – with IPV (Emery, Jolley, & Wu, 2011).

Results have been mixed in support of the association between community rates of crime and violence and IPV (Li, et al., 2010; Raghavan, et al., 2006). However, higher levels of perceived violence, exposure to violence, or worry about violence have been found by several researchers to be associated with IPV (Naved & Persson, 2008; Raghavan, et al., 2006; Raghavan, et al., 2009; Reed, et al., 2009; Stueve & O'Donnell, 2008).

Cultural and socio-behavioral influences have been found to be important, particularly in developing country contexts. Higher levels of IPV in social networks and communities have been found to be associated with increased likelihood of experiencing IPV (McQuestion, 2003; Raghavan, et al., 2006; Raghavan, et al., 2009; Uthman, et al., 2011). In addition, there is considerable evidence to suggest that communities with high levels of women's empowerment are protective against IPV (Ackerson, et al., 2008; Ackerson & Subramanian, 2008; Boyle, et al., 2009; Koenig, et al., 2003), including women's participation in savings/credit groups (Koenig, et al., 2003), women's autonomy (Koenig, et al., 2003), female literacy (Ackerson, et al., 2008; Boyle, Georgiades, Cullen, & Racine, 2009) and gender equality (Ackerson, et al., 2008). It is important to note that all of the evidence regarding aggregate levels of women's empowerment and IPV comes from developing country contexts.

Evidence surrounding urbanicity and rurality is mixed and limited. Some evidence suggests that increasing rurality may be associated with IPV (Aklimunnessa, Khan, Kabir, & Mori, 2007; Antai, 2011; Flake, 2005), while one study found a link between urbanicity and IPV (Abeya, Afework, & Yalaw, 2011). Most studies examining the importance of urbanicity and rurality have been done in developing countries, and many studies have limited methodology to binary urban versus rural categories, despite the differences among urban, suburban, rural farm, rural nonfarm, and remote types of environments. Very little evidence has linked alcohol outlet density to IPV occurrence (McKinney, et al., 2009; Waller, et al.,

2011). Overall, for the constructs tested by more than one analytic approach, the type of statistical model employed (logistic regression versus multilevel or survey regression) did not appear to affect conclusions drawn.

Summary

The preponderance of studies in our review suggest that some neighborhood-level factors are associated with IPV. Of the 36 studies reviewed, 30 reported a positive association between one or more community or neighborhood characteristics and some type of IPV; however, 13 of these studies did not use an analytic method that accounted for ecological levels (i.e., individual variables, neighborhood variables). Of the 17 studies that did account for ecological levels in some way (either via sample stratification or a multilevel analytic method), the vast majority found associations between neighborhood/community indicators and IPV, independent of individual-level variables.

This growing body of literature examining neighborhood factors associated with IPV is an exciting contribution to IPV research. There is ample evidence to indicate that some aspects of neighborhood may be risk markers or risk factors for IPV, independent of individual characteristics. This knowledge can help to frame future research questions and hypotheses, and importantly, build a framework for testing community-level public health interventions that focus on changes in urban planning, education of women, and community norms about violence.

In terms of future research, new work should carefully consider and then model or test the types of sophisticated theoretical approaches and conceptual models that are now predominantly in the sociological literature. Better articulation of theory should lead to more specific measures of community-level indicators. We found wide variation in definitions of “community” and “neighborhood,” although this is in part related to local definitions and differences in regions. While US studies had access to similar Census-based definitions (e.g., Census tract), the non-US studies relied on different definitions of community or differentiated between urban and rural, or coastal and non-coastal areas. Future efforts should consider the benefits and limitations of different geographical definitions and identify the most appropriate geographies for the research questions asked. Future work should also expand and compare types of violence (physical, sexual, psychological/emotional) and types of perpetrators and victims (male/female, heterosexual/LGBTQ). In particular, very few studies have considered psychological or emotional violence and aggression, and no studies reviewed specifically focused on same-sex relationships.

Similarly, US and Canadian research used Census indicators of neighborhood socioeconomic status, while scholars studying IPV in Asia used data on community attitudes towards women, violence towards women, and women's literacy and education. While both approaches have merit, and reflect available sources of data, the non-US studies appear to be particularly innovative in quantifying community norms and attitudes towards women based on theory. Furthermore, community norms and attitudes can be modified through systems- and community-level interventions (e.g., improving education for women), while socioeconomic indicators are more accurately risk markers and are less modifiable than community attitudes.

Discussion

Overall, we found that articles based in sociology and criminology often provide stronger and more systematic theoretical bases for their research questions or hypotheses. Epidemiological studies are making progress, particularly in methodology, but most studies in our review lacked theoretical basis or conceptual models showing hypothesized pathways of influence. From our review, it is clear that the extant literature relating residential environments to IPV has examined a number of interwoven pathways by which a residential environment may lead to increased occurrence of IPV.

The most frequently described pathways linking neighborhood environment to IPV, especially in the US, rely on social disorganization theory. Developed primarily by sociologists at the University of Chicago, and attributed primarily to Shaw and McKay and their influential work *Juvenile Delinquency and Urban Areas*, this theory has been traditionally used to explain rates of violent crime in urban settings (Sampson & Groves, 1989; Shaw & McKay, 1942). Social disorganization theory describes the process by which conditions of socioeconomic disadvantage and residential instability disrupt social bonds and limit collective activity to maintain social control, increasing the likelihood of deviant behaviors such as violence (Perkins & Taylor, 1996; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997). Although originally proposed in relation to more public forms of violence, researchers have more recently begun to adapt this theory to IPV (Benson, et al., 2003; Raghavan, et al., 2006). Browning (2002) acknowledges that intimate violence differs in two main ways from other types of violence, which may modify the role for social disorganization in affecting IPV: the questionable ability of the community to monitor intimate violence as it often takes place hidden from public view, and the potentially false assumption that community members will recognize violence between intimate partners as deviant, and therefore feel it necessary to intervene (Browning, 2002).

Also suggested is a relationship between the nature of cultural norms at the neighborhood level and perpetration of intimate violence. Borrowing from Sampson and Wilson's notion of the "cognitive landscape" of ecologically structured norms that guide appropriate conduct (Benson, et al., 2003; Sampson & Wilson, 1995), some researchers have suggested that under certain conditions, violence may become normalized (McQuestion, 2003), attributing this normalization of violence to prevailing levels of community or societal violence. This may result in the notion that that violence is an acceptable way to resolve conflict and even an appropriate way to treat women. In addition to increased violence, others may be less inclined to intervene or even view it as a negative behavior (Browning, 2002; Raghavan, et al., 2009). McQuestion (2003) suggests that IPV may also be reinforced through a more general social learning process, where "high IPV neighborhoods are places where individuals observe influential others being rewarded for engaging in the behavior and adopt it themselves. A low IPV neighborhood is one where IPV perpetrators are socially ostracized or otherwise punished, making it less likely others will reproduce the behaviors" (McQuestion, 2003).

Theories of social support/social isolation appear frequently in the IPV literature, where scholars posit that added social support and decreased social isolation may reduce the

likelihood of occurrence (Lanier & Maume, 2009; Van Wyk, et al., 2003). However, it has been suggested that particular social networks can in fact encourage IPV through “embeddedness” in a culture where IPV is common (Raghavan, et al., 2006). The notion of social support has been conceptualized as a protective factor for family violence and other health and health-related outcomes. However, scholars do not fully agree on either measures of social support or on mechanisms for how social support acts on physiology or behavior. In communities where the social atmosphere centers around drugs and violence, social isolation may be protective. Caughey and others have observed that neighborhood attitudes are not homogenous and that multiple norms may exist (Caughey, Brodsky, O'Campo, & Aronson, 2001). Brodsky (1996) found that resilient mothers living in disadvantaged neighborhoods create personal boundaries to protect themselves and their families from “negative psychological sense of community” (Brodsky, 1996). Wallis (2010) reported that women with less social support were more resilient in the face of challenging conditions; like Brodsky, she found that some women protect themselves and their children from the negative social support in the neighborhood (Wallis, Winch, & O'Campo, 2010). The meaning of these insights for research is that the constructs of “social support” and “isolation” are very complex and need to be clearly specified in research. Without such specification, there is potential for incorrectly measuring or interpreting “social support,” “isolation,” and other related constructs; thus, the family that isolates itself from community influences could exhibit fewer factors associated with violence than a family engaged in a “negative” community.

The non-US literature places more emphasis on community constructs regarding women's empowerment, often measured through education or literacy as a proxy. Koenig and colleagues use women's participation in savings/credit groups as a proxy for education (i.e., “autonomy”) and found that a lower index of autonomy was associated with more violence in one region in Bangladesh. In India, Koenig examined “wife beating” norms and found that the district-level murder rate was associated with higher rates of physical abuse against women. Ackerson and colleagues analyzed Indian national survey data, finding that female and male literacy were inversely associated with IPV (Ackerson, et al., 2008). Although this study addresses the education of women as a risk/protective factor, the authors do not fully describe the pathways through which education may be related to abuse.

Beyond identifying associations between neighborhood characteristics and IPV, it is important to consider the pathways responsible for the associations observed. Identifying these pathways is critical to identifying future targets and approaches for intervention. To this end, and drawing from the literature reviewed, we present a list of pathways (Table 3) that have been proposed as linking neighborhood environment to the occurrence of IPV, following the domains identified in Table 2, and discuss these pathways below. These domains and pathways and can form the basis for a conceptual framework to guide future research.

Neighborhood level factors can create an environment of increased risk for IPV. Socioeconomic disadvantage is an often cited determinant of health and has been linked with numerous disease and injury categories. Concentrated socioeconomic disadvantage at the neighborhood or community level is often discussed as an antecedent to violence as well

as a cause of other antecedents to violence, including social disorganization, social disorder, physical disorder and residential instability (Benson, et al., 2003; Benson, et al., 2004; Browning, 2002; Miles-Doan & Kelly, 1997; Van Wyk, et al., 2003). Conditions of concentrated disadvantage may limit employment and other opportunities, increasing residential instability and levels of stress (O'Campo, et al., 1995), limiting or weakening social ties among neighbors, and decreasing neighbors' sense of community and attachment to place (Browning, 2002). Neighbors with weak or non-existent relationships will be less willing or able to collaborate to solve problems affecting the neighborhood as a whole (Browning, 2002), and community resources will be limited (Burke, O'Campo, & Peak, 2006).

In conditions of socioeconomic disadvantage and/or weakened neighborhood social cohesion, buildings, parks and other physical features of the neighborhood can fall into disrepair, and this physical disorder may signal the neighborhood's unwillingness or inability to maintain social control, thus encouraging violence (Wilson & Kelling, 1982). Behavior responds to the neighbors' collective inability to maintain social control; social disorder ("behavior usually involving strangers and considered threatening") (Sampson & Raudenbush, 1999, p 603) may increase, further signaling that few sanctions will occur to curb violent behavior, especially in private spaces.

In addition, alcohol outlets abound, serving those who may turn to alcohol to diminish levels of stress or worry, increasing the likelihood of alcohol abuse, and providing locations for like-minded individuals to congregate and reinforce attitudes, norms and behaviors – including those supporting intimate violence and alcohol abuse – through social interaction (Cunradi, 2010; McKinney, et al., 2009; Raghavan, et al., 2006). Another possibility is that there are more alcohol outlets because there is more demand for alcohol; or, less regulation/zoning against alcohol selling establishments. Violence may be considered by neighbors to be an acceptable way to deal with problems, either due to cultural antecedents or to the normalizing effect that prolonged exposure to violence produces (Raghavan, et al., 2006); violence against women may be especially accepted (Ackerson, et al., 2008).

In some places, the status of women is low, and women may have limited education, few financial resources, and few friends or family members to turn to. They may have numerous other urgent concerns stemming from environmental conditions, such as financial stability or caring for young children as a single, or more responsible, parent. Traditional gender roles may prevail, or educational opportunities may not be available on an equal basis, further subordinating women (Ackerson, et al., 2008; Boyle, et al., 2009). Perhaps attributable to the overall diminished status of women, or to the disorganization of the neighborhood, victims of abuse may interact socially with others experiencing partner violence, thus normalizing the violence they are experiencing and reducing their ability to end the violence (Allen, Swan, & Raghavan, 2009; Raghavan, et al., 2006). Neighbors may not intervene, due to weakened social ties (Van Wyk, et al., 2003), lack of communication (Burke, et al., 2006), norms for non-intervention and keeping to one's own business (Benson, et al., 2004; Browning, 2002), or may not be alert or vigilant in response to intimate violence occurring in the neighborhood (Burke, et al., 2006).

In environments characterized by conditions such as these, intimate relationships can suffer. Due to low levels of economic development and opportunity, a potential abuser may have unstable, infrequent or absent employment, increasing his levels of, rage, frustration and embarrassment about his inability to achieve the perceived imperative to provide for his family (Li, et al., 2010; McQuestion, 2003; Raghavan, et al., 2006), and potentially also his use of alcohol. He may have few social ties and little concern that neighbors are paying attention to, or are likely to intervene to stop, his abusive behavior (Benson, et al., 2004); social interactions he does have may involve alcohol or may be with individuals in his social network who are also abusive or accept the subordination and/or control of women (Raghavan, et al., 2006; Raghavan, et al., 2009). To protect himself, the abuser may limit the victim's contact with other people, which is not difficult to accomplish given the disorganized and highly mobile nature of the community. Victims become increasingly dependent on the abuser and opportunities to generate social support that could reduce exposure to IPV are diminished (Raghavan, et al., 2006; Raghavan, et al., 2009; Van Wyk, et al., 2003). Overall, conditions such as these increase the likelihood that IPV will occur and decrease the likelihood that it will end.

Limitations

Our review is limited to papers published in English, and thus may not include studies from countries or regions where research findings are primarily published in another language or studies cited in reports. We have also limited our review to efforts that model IPV occurrence while considering both individual and contextual influences. Much can be learned about constructs linking environments to IPV from qualitative research (Burke, et al., 2006), in addition to descriptive accounts that may not take a modeling approach. A future review could consider these areas. Our discussion is framed primarily to reflect the types of IPV included in the papers reviewed, and thus does not reflect a full examination of race, ethnicity, gender or sexual orientation. Finally, while a comprehensive review is valuable in identifying broader themes, trends and research directions, future work could focus on specific sub-populations defined by socio-demographic characteristics, type of violence (physical, sexual, psychological), or forms (victimization, perpetration, mutual IPV). We generalize our description to consider urban and rural settings and developed and developing country settings simultaneously. It is possible, and even likely, that pathways linking environments to IPV differ between these categories of environments.

Conclusions

The literature on neighborhood environment and intimate partner violence is young, but receiving increasing attention from researchers in sociology, public health, criminology, and other fields. This review has identified several key policy and practice implications as a result of the ongoing examination of neighborhood environmental factors and IPV. These implications, listed in Table 4, provide a starting point for addressing the features of neighborhoods that may influence IPV.

Gaps in the literature reviewed include limited consideration of non-urban areas, limited theoretical motivation, and limited consideration of the range of potential contributors to

environmental effects on IPV. Built environmental factors, such as access to IPV, health, faith-based or social services, or the importance of urban planning initiatives aimed toward improved health, safety, and social interaction – such as residential architectural features (front porches, front yards, housing density), reduced numbers of vacant lots, or neighborhood parks and greening – have not been examined. Race, ethnicity and culture have only rarely been explicitly considered in studies relating neighborhood factors to IPV. Other gaps include little information from the developing world or from regions including Europe and the Middle East, although this omission could be associated with our limitation of the literature reviewed to English language only. In addition, as the literature explicitly examining the importance of neighborhood environment on IPV is still developing, explanations of the pathways by which place influences IPV remain limited and draw mainly from social disorganization theory, which was developed in urban settings and may need to be expanded and adapted, especially to be useful in explaining residential environmental correlates of IPV in rural settings.

Much room for future research remains. A more complete theoretical understanding of the relationship between place and IPV, especially considering differences among urban, semi-urban and rural settings, and developed and developing country settings, and expanding the range of neighborhood characteristics considered – particularly those that are more amenable to intervention – will be necessary to advance research questions and improve policy and intervention responses to reduce the burden of IPV.

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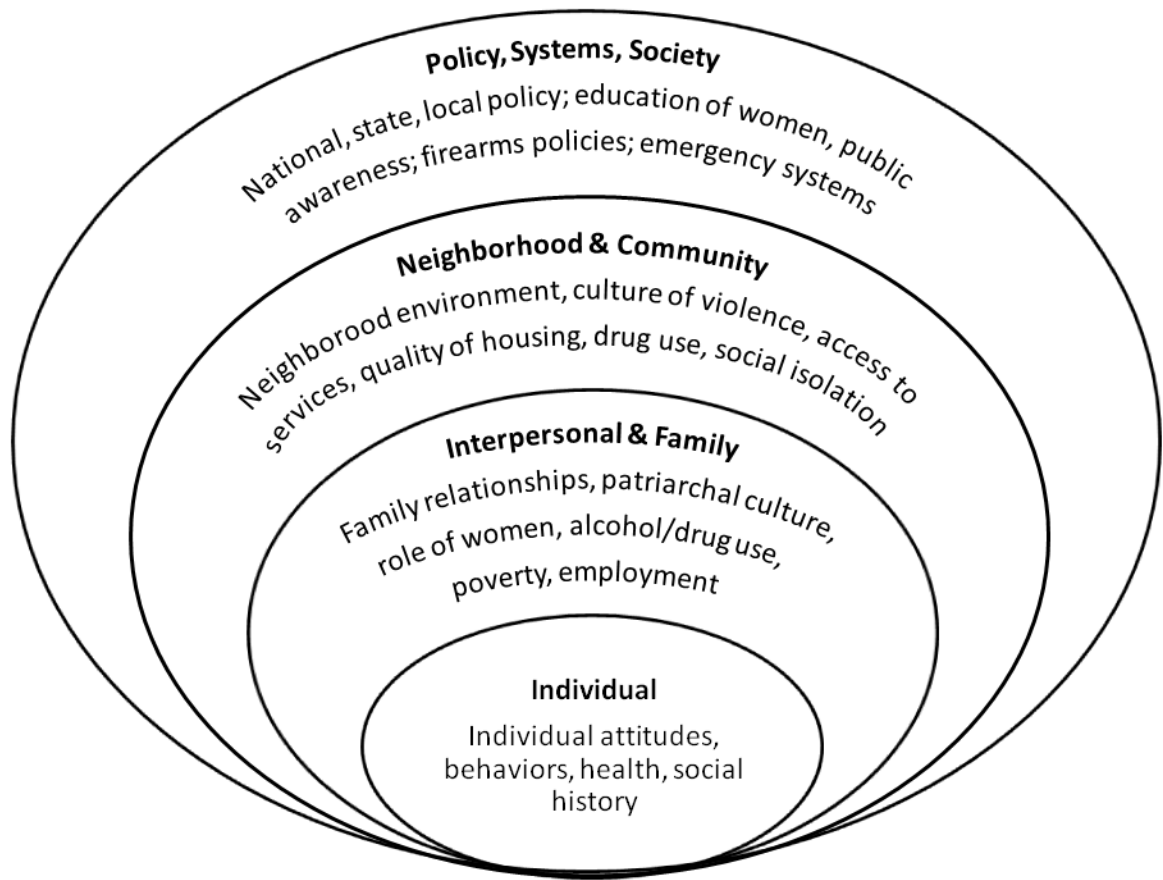


Figure 1. Conceptual model relating individual, social and ecological factors to intimate partner violence

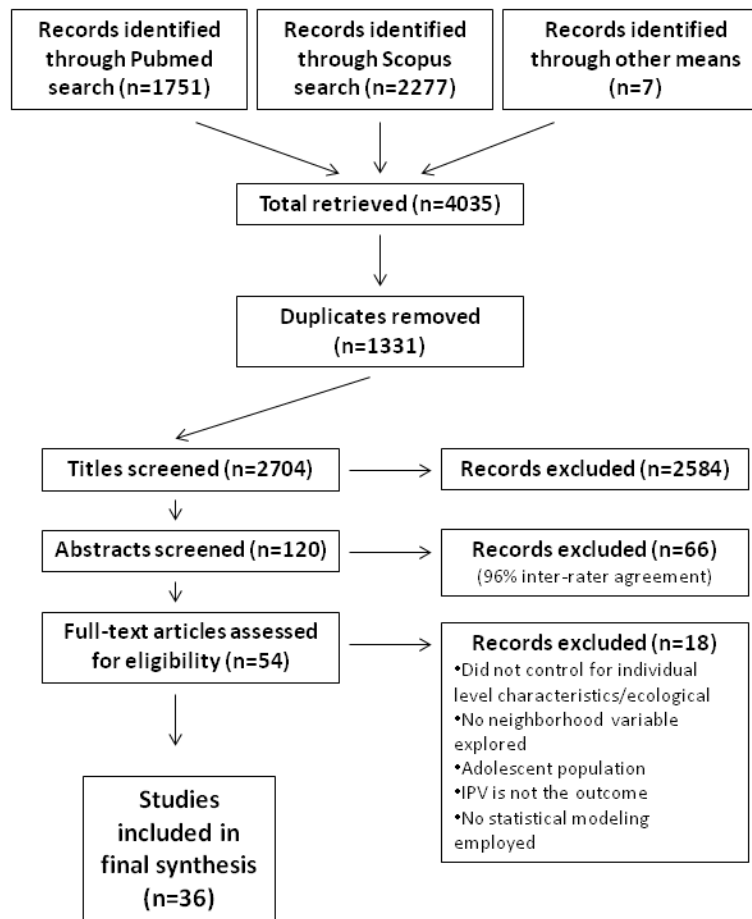


Figure 2. Article search strategy based on PRISMA guidelines (Moher, et al., 2009)

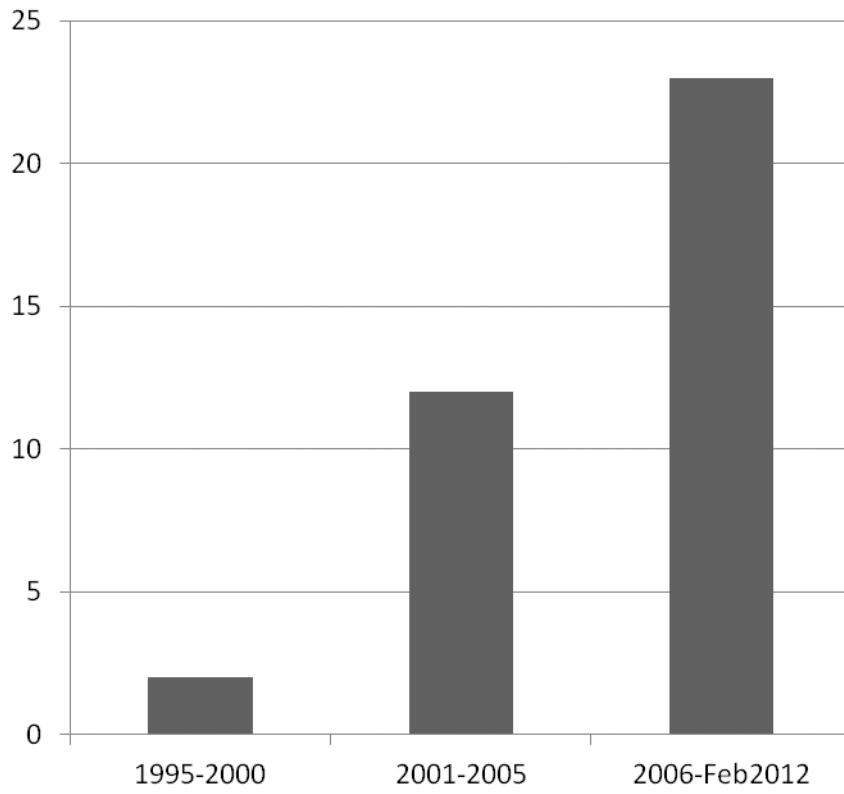


Figure 3. Increase in number of peer-reviewed papers modeling effects of neighborhood environment on intimate partner violence while controlling for individual characteristics, (1995 through February 11, 2012, n=36)

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Table 1
Studies Exploring the Statistical Relationship Between Neighborhood Environment and Intimate Partner Violence risk, Listed Chronologically

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
<p>O'Campo et al, 1995 Baltimore City, USA (urban)</p>	<p>Design: Cross-sectional study Population: Pregnant women (n=160) Data source: interviews conducted during 3rd trimester and 6 months postpartum</p>	<p>Outcome: moderate or severe physical IPV victimization in prior 6 months as measured by Conflict Tactics Scale (CTS) Covariates: age, employment, marital status, education, parity, race, confidant: male partner, confidant: social support, other instrumental support, partner drug use Predictors of interest: neighborhood ratio of home owners to renters, unemployment rate, per capita income less than \$13,500</p>	<p>Analytic method: Two-level logistic regression modeling and GEE Definitions: Neighborhood defined as 1990 US Census Tract</p>	<p>Neighborhood-level variables (unemployment and per capita income) were associated with increased risk and the neighborhood-level variables modified the relationships of the individual-level variables to the risk of violence. This study found that neighborhood unemployment increased risk for IPV by more three times using the MLM approach; and nearly 5 times using the GEE approach.</p>	<p>Strengths:</p> <ul style="list-style-type: none"> • Compared two methods of estimating multilevel associations. • Included discussion of implications for public health policy and practice. <p>Limitations:</p> <ul style="list-style-type: none"> • Emphasis is on the analysis approach, with little discussion of theoretical backdrop.
<p>Cunradi 2000 48 contiguous states, USA (national)</p>	<p>Design: Cross-sectional study Population: Black, White and Hispanic couples (n=1440 couples) Data source: Interviews as part of 1995 National Alcohol Survey</p>	<p>Outcome: moderate or severe physical IPV occurrence in prior year (male-to-female or female-to-male victimization or perpetration) as measured by a modified version of the CTS Covariates: income, marital status, children under 17, years lived with partner, couple mean age, couple age difference, couple mean education, couple education difference; for both male and female partners – unemployment, childhood violence, approval of marital aggression, alcohol related problems, alcohol volume, impulsivity Predictors of interest: neighborhood poverty defined as 1990 Census Tracts with >20% living under Federal poverty line; undereducation (% of</p>	<p>Analytic method: Multilevel logistic regression with analyses stratified by race (White, Black, Hispanic). Definitions: Neighborhood defined as 1990 US Census Tract</p>	<p>Undereducation, working class composition, and poverty were associated with IPV for all races, but significantly associated only for black couples (OR=2.87) for male-to-female partner violence.</p>	<p>Strengths:</p> <ul style="list-style-type: none"> • Strong measures of individual characteristics and outcome variable. • Measures of neighborhood variables well-defined, although some domains may be open to question (e.g., definition of working class) • The authors provide policy implications, noting that state/Federal/local governments should aim to alleviate inner-city poverty, because of its relationship to IPV. <p>Limitations:</p> <ul style="list-style-type: none"> • Neighborhood is defined as the Census Tract, but there is no discussion of the meaning of neighborhood or community, either from a theoretical or practical standpoint. Census Tracts do not necessarily

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Mears et al. 2001 Large urban county in Texas (USA)	Design: Cross-sectional study Population: IPV cases resulting in police and/or court records. Data source: cases sampled from court and police records for January, August and October for 1990, 1991 and 1992 (n=336).	population without high school education); unemployment (% of persons without high school education); unemployment (% of persons without high school education) but currently unemployed); working class composition (% of employed population in defined "working class" occupations, such as clerical, sales, machine operators, etc) . Outcome: physical IPV re-victimization (derived from CTS) prevalence and time to re-victimization Covariates: age, number of prior victimizations, number of times prior drug use, race/ethnicity Community-level covariates: 1990 Census Block median family income coded into three categories Predictor of interest: Census Block median family income	Analytic method: Cox regression survival analysis to examine efficacy of protective orders (POs), arrests, and combined PO and arrest. Definitions: Neighborhood defined as US Census Block.	Low Census Block median family income was marginally significantly associated with an increased re-victimization rate (RR=1.752).	Strengths: <ul style="list-style-type: none"> Solid theoretical basis about how and why individual and contextual factors might influence the efficacy of police interventions (e.g., PO). Limitations: <ul style="list-style-type: none"> Results may be limited in ability to generalize because not all IPV incidents or re-victimizations are reported to the police.
Browning 2002 Chicago, USA	Design: Cross-sectional study Population: Women involved in heterosexual relationships Data source: surveyed as part of the 1995-1997 Chicago Health and Social Life Survey (n=199).	Outcome: nonlethal severe physical IPV victimization in prior year based on questions derived from the CTS Covariates: race, age, income, sexual abuse during childhood, education, marital status, jealousy as source of conflict, number of conflict sources, relationship duration, years residing in the neighborhood, free time with mutual friends/family Predictors of interest: neighborhood concentrated disadvantage, residential stability, immigrant concentration, collective efficacy, norm of nonintervention, violent victimization	Analytic methods: Two- and three-level hierarchical logistic regression models Definitions: Neighborhood defined by Chicago neighborhood boundaries, which are based on 1990 US Census Tracts.	While controlling for individual-level characteristics, collective efficacy is significantly negatively associated with partner violence and stronger nonintervention norms are significantly positively associated with violence; Concentrated disadvantage, residential stability and immigrant concentration were not associated with partner violence.	Strengths: <ul style="list-style-type: none"> Very strong theoretical underpinnings that give context to the hypotheses and the selection and construction of variables. Strong description of "neighborhood" based on survey respondents' delineation of neighborhood The concept of "collective efficacy" has been well-developed by this research group and incorporated into other studies of violence, abuse, and health. Limitations: <ul style="list-style-type: none"> Sample size considerations limited statistical power.
Van Wyk et al. 2003 USA (national)	Design: Cross-sectional study	Outcome: physical IPV occurrence in prior year	Analytic Methods: Logistic regression	Neighborhood disadvantage is significantly associated	Strengths:

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
<p>Benson et al. 2003 USA (national)</p>	<p>Population: Couples included in waves 1 and 2 of the National Survey of Families and Households (n=6610 couples) Data source: Interviews with couples included in waves 1 and 2 of the NSFH</p>	<p>Covariates: race, subjective financial satisfaction, duration of union, marital status, contacts with others, SES for couples Predictors of interest: neighborhood disadvantage</p>	<p>Analytical approach: Logistic regression Definitions: Neighborhood defined as 1990 US Census Tract</p>	<p>for violence and other individual characteristics in wave 1 data indicates that neighborhood economic disadvantage, neighborhood residential instability, male employment instability, and subjective financial strain influence likelihood of violence at wave 2. In the final model, neighborhood disadvantage was associated with IPV (OR=1.36; ns). Residential instability significantly reduced the odds of IPV (OR=0.13). Other significant variables were violence at wave 1 (OR: 2.48), employment instability (OR:1.40), and subjective financial strain (OR: 1.33)</p>	<ul style="list-style-type: none"> Strong grounding in social disorganization theory and sociological work Includes an examination of individual-level social support in concert with structural disadvantage (as opposed to social disorganization) Strong conceptualization of community/neighborhood and neighborhood factors Used factor analysis based on 14 Census variables to create an index to measure structural disadvantage. <p>Limitations:</p> <ul style="list-style-type: none"> Does not employ multilevel modeling structure, thus suggesting that ecological fallacy may underlie findings.
<p>DeMaris et al (2003) USA (national)</p>	<p>Design: Cross-sectional study Population: Couples in survey waves 1 and 2 of the National Survey of Families and</p>	<p>Outcome: physical IPV occurrence in prior year (male-to-female or female-to-male victimization or perpetration) based on questions derived from the CTS Covariates: male drinking/drugs, female social support, race, employment instability, income to needs ratio, change in income to needs ratio, subjective financial strain, age, man's education, prior report of violence Predictors of interest: neighborhood concentrated disadvantage, neighborhood residential instability</p>	<p>Analytic method: Multinomial regression Definitions: Neighborhood defined</p>	<p>Neighborhood economic disadvantage was significantly, positively associated with intense</p>	<p>Strengths:</p> <ul style="list-style-type: none"> Strong theoretical underpinnings from the sociological literature with effort to understand whether associations observed at the aggregate level (e.g., rates of IPV are higher in disadvantaged neighborhoods) exist because of contextual effects or because of reporting bias. Created indices of concentrated disadvantage based on 5 Census variables modeled on previous work. <p>Limitations:</p> <ul style="list-style-type: none"> Did not employ multilevel modeling structure, thus suggesting that ecological fallacy may underlie findings.
		<p>Outcomes: three category "violence profile" variable: no violence, physical aggression, intense male</p>			<p>Strengths:</p> <ul style="list-style-type: none"> As with the other studies from this group (list from above)

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
<p>McQuestion, 2003 Colombia (national)</p>	<p>Households where the male partner was seeking employment or employed Households where the male partner was seeking employment or employed Households where the male partner was seeking employment or employed Data source: Interviews with couples included in waves 1 and 2 of the NSFH</p>	<p>status, woman's age at union, first union, man's isolation, hazard of exclusion, number of children, substance abuse, disagreement frequency, disagreement style, man and woman employment, education, and gender ideologies Predictors of interest: neighborhood economic disadvantage</p>	<p>Analytic method: Two-level random intercept logistic regression Definitions: Neighborhood defined by primary sampling units from survey</p>	<p>violence (OR=1.05) as compared to no violence; disadvantage was not associated with physical aggression, when compared to no violence. Significant associations between individual factors and physical aggression included both partners being in their first union (OR: 1.35), number of children (protective) (OR: 0.87), and substance abuse (OR: 1.57). Individual risk factors for intense male violence (versus no violence) included the female partner having a non-traditional ideology (OR: 1.61) and substance abuse (OR: 1.66).</p>	<p>Strengths and limitations</p> <p>background and integration is strong and supports the development of research questions that inquire about a variety of forces operating at several levels of social life and their association and/or impact on violence.</p> <ul style="list-style-type: none"> Integrates such individual factors as relationship stressors (e.g., aspects of the relationship that promote ongoing tension), conflict management, and "conditioning factors (e.g., isolation from social networks) as proximal influences. <p>Limitations:</p> <ul style="list-style-type: none"> Although the individual and contextual factors noted above carry theoretical gravitas, it is unclear that the statistical power, data source, or analytic methodology is capable of truly distinguishing these factors. Relationship stressors, for example, are analyzed individually, not through creation of a stressor index or scale. As in prior studies, they describe limitations related to collinearity. As in prior studies, they did not employ multilevel modeling structure, thus suggesting that ecological fallacy may underlie findings.
	<p>Design: Cross-sectional study Population: Women of reproductive age (n=6131) Data source: Colombia's 1995 Demographic and Health Survey.</p>	<p>Outcomes: ever (1) hit or (2) forced to have sex by current husband/partner Covariates: marital status, age, number of live births, respondent's and partner's education and occupational prestige, durable vs. dirt floor, urban versus rural residence, region</p>		<p>Social effects measures are significantly associated with risk for both coerced sex (OR=1.349) and beating (OR=1.643), indicating that social norms may influence risk for IPV</p>	<p>Strengths:</p> <ul style="list-style-type: none"> Considers social effects explicitly and a range of covariates. The only study conducted in Colombia. DHS measures of socioeconomic position incorporated.

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
		Predictors of interest: cluster-level reports of coerced sex and beating			Limitations: <ul style="list-style-type: none"> Measurements of social norms are aggregates of individual responses used to assess outcomes and do not consider the existence or nature of complex social networks.
Koenig et al, 2003 Bangladesh, two regions (rural)	Design: Cross-sectional study Population: Women ages 15-49 (n=10,368) Data source: 1993 Knowledge, Attitude and Practice survey of the Family Health Research Project	Outcome: Physical beating of woman by husband or husband's family Covariates: Number of living sons, wife's age, religion, husband's education, wife's education, landholdings, family structure, credit group membership, women's autonomy index Predictors of interest: community-level women's education, credit group membership, women's autonomy index	Analytic methods: Two-level logit model Definitions: Neighborhood defined as the civil administrative unit called a <i>mozza</i> , which was used as the primary sampling unit. Neighborhood measures are aggregates of survey responses.	A smaller proportion of women in the community who belong to savings and credit groups and a lower index of women's autonomy are significantly associated with risk of violence (by husband or husband's family) in one of the study regions (Jessore) but not the other (Sirajgonj).	Strengths: <ul style="list-style-type: none"> The first study conducted in Bangladesh. Guided by a conceptual framework using the concept of women's autonomy/empowerment as a domain Strong analysis approach. Limitations: <ul style="list-style-type: none"> The time period within which measured IPV took place was not clearly specified in the measurement instrument and actions constituting physical violence were not explicitly stated.
DeKeseredy et al 2003 Eastern Ontario, CA (urban)	Design: Cross-sectional study Population: Men and women in public housing estates (n=325) Data source: Quality of Neighborhood Life Survey	Outcome: moderate or severe physical IPV victimization in prior year (measured using modified version of CTS-2) Covariates: age (others were tested but did not enter models) Predictors of interest: neighborhood-level perceived collective efficacy, disorder, crime level, drug problems	Analytic Method: Logistic, forward regression Definitions: Neighborhood defined by individual reports of neighborhood characteristics.	After controlling for age, higher collective efficacy is significantly, negatively associated with IPV victimization.	Strengths: <ul style="list-style-type: none"> Strong theoretical underpinnings with explication of social disorganization and collective efficacy as ecological variables. Uses a model to link community characteristics to victimization, either by way of ecological processes, or direct impact of the neighborhood characteristics. Limitations: <ul style="list-style-type: none"> Generalizability is limited by the study population.
Benson et al, 2004 USA	Design: Cross sectional study Population: White and African American married or cohabiting couples in waves 1 and 2 of the	Outcome: physical IPV victimization in prior year, using items based on the CTS.	Analytic Method: Stepwise logistic regression	Concentrated neighborhood disadvantage is significantly associated with risk of IPV (OR=1.31), and reduces OR	Strengths: <ul style="list-style-type: none"> Theoretical recognition that the associations observed

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Lauritsen and Schaum 2004 USA (national)	National Survey of Families and Households Data source: Interviews with couples included in waves 1 and 2 of the NSFH	Individual (index based on household size to income ratio, satisfaction with finances, and employment stability), male educational attainment, male alcohol use, and age, subjective financial strain, job instability, education, income to needs ratio, drinking problems Predictors of interest: neighborhood concentrated disadvantage	Definitions: Neighborhood defined as 1990 US Census Tract	for race alone as a risk factor, while controlling for individual characteristics.	<p>between race and health outcomes, including violence, may be confounded by community context.</p> <ul style="list-style-type: none"> Moreover, the authors assert that while many studies note the association between race and IPV, they do not offer interpretation. <p>Limitations:</p> <ul style="list-style-type: none"> The stepwise regression attempts to account for individual and community variables in a single model rather than a multi-level model.
Lauritsen and Schaum 2004 USA (national)	Study design: Cross-sectional study. Population: Women 18 (n~90,000) Data source: participants in the 1995 Area-Identified National Crime Victimization Survey	Outcome: Attempted or completed assault, robbery, rape or sexual assault in prior 6 months perpetrated by a current or former intimate partner Covariates: age, race, ethnicity, family structure (including marital status and presence of children), household income, evenings at home, length of residence Predictors of interest: Neighborhood percent poverty, female-headed households with children, black, and children <18, and whether in central city	Analytic method: Logistic regression Definitions: Neighborhood defined as US Census Tract	Living in a neighborhood with a neighborhood proportion of female-headed households and children <18 was significantly, positively associated with IPV victimization. Neighborhood poverty was significantly, negatively associated with IPV victimization.	<p>Strengths:</p> <ul style="list-style-type: none"> Accounts for individual, family, and community characteristics. Informed by feminist theory and provides strong theoretical background for attempting to understand the influence of context on IPV. Informed by feminist theory as a model for understanding the influence of context on IPV. <p>Limitations:</p> <ul style="list-style-type: none"> Analysis limited to a small number of highly correlated community characteristics Theoretical guidance for selection of characteristics is limited.
Naved 2005 Bangladesh (one urban and one rural region)	Design: Cross sectional study Population: Ever-married women of reproductive age (n=2702). Data source: Population-based survey associated with the WHO multi-country study on domestic violence.	Outcome: Physical IPV victimization in prior 12 months and over lifetime, based on CTS, including frequency Covariates: Individual-level: Age, husband's education, whether woman earns an income, savings/credit group membership,	Analytic method: Multilevel regression model Definitions: Neighborhood defined as the <i>mohalla</i> or village. Neighborhood variables are defined by aggregating individual	A higher proportion of adults in the community who worry about crime in their community is associated with an increased likelihood of physical intimate partner violence (OR=5.60 in the urban region and OR=6.07 in the rural region), although the	<p>Strengths:</p> <ul style="list-style-type: none"> Conceptual framework for determinants of spouse abuse that includes individuals, husband-wife dyad, family, immediate social context (e.g., support services), and larger social context (e.g., gender

Citation/setting	Study design/data source(s)	Variables Predictors of interest: region of residence, urban/rural	Analytical approach development, and less	Results/conclusions is characterized by dense	Strengths and limitations associated with violence may
Koenig et al, 2006 4 districts in Uttar Pradesh, North India	Study design: Cross-sectional study Population: Married men 15-59 (n=4,520) Data source: Interviews from the Male Reproductive Health Survey, which is a component of the PERFORM study, a stratified, multistage cluster sample survey conducted in 28 districts of Uttar Pradesh	Outcomes: physical or sexual violence perpetration against wife in prior year Covariates: husband's education, wife's education, household asset index, economic pressure, area of residence (rural/urban), marital duration, childless, husband history of extramarital relationship, intergenerational exposure to violence Predictors of interest: community economic index, community electricity, community female education, community gender norms, community wife beating norms, district murder rate	Analytic method: Multilevel logistic regression modeling. Definitions: Neighborhood defined as survey primary sampling units; includes districts.	Community "wife beating" norms at both the primary sampling unit and district level were significantly associated with physical violence. District murder rate was significantly associated for both physical and sexual violence. An economic index, community electricity, female education and gender norms were all non-significant.	Strengths: <ul style="list-style-type: none"> Consideration of and development of a community economic index. Consideration of additional community attitude factors, such as wife-beating norms. Guided by theory about context and community factors that may affect risk of domestic violence. Limitations: <ul style="list-style-type: none"> Reports of violence gathered from men, who may not accurately report a negative behavior like abuse (the authors note this potential limitation).
Raghavan 2006 Six US states (NY, OK, TN, MO, CA, NC)	Study design: Cross-sectional study Population: Women 18 receiving or eligible for Temporary Assistance to Needy Families (TANF) and had a drug problem (n=50). Data source: a study examining social network composition in a welfare to work program	Outcome: physical IPV victimization in last 6 months, based on items from the Revised Conflict Tactics Scale Covariates: substance use Predictors of interest: neighborhood social disorder, network IPV, community violence	Analytic method: Logistic regression modeling. Definitions: Neighborhood defined by individual self-report of neighborhood characteristics.	IPV within a woman's social network and community violence were significantly associated with IPV risk; social disorder not significantly associated with IPV.	Strengths: <ul style="list-style-type: none"> Based on social disorder theory, including community violence and collective efficacy/social disorganization. Follows Sampson et al. in concern about the association between community disorder and violence. Strong explanation of theory based on current research. Considers the influence of violence in a woman's social network on her own risk of

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Cunradi 2007 USA	Study design: Cross-sectional study Population: Married or cohabiting Hispanic, Black and White individuals ages 18 and older (n=21,029). Data source: the 2000 National Household Survey on Drug Abuse	Outcome: mutual physical IPV in prior year Covariates: drinking level, race/ethnicity, education, age Predictors of interest: perceived neighborhood disorder; interaction among drinking behavior and perceived neighborhood disorder	Analytic method: Logistic regression modeling, accounting for multistage, multi-cluster sampling strategy. Definitions: Neighborhood defined by individual self-report of neighborhood characteristics.	Neighborhood disorder was independently associated with mutual IPV for men (OR=1.61); for women, neighborhood disorder moderated the relationship between drinking level and mutual IPV, increasing risk under conditions of high neighborhood disorder.	<p>violence. Includes substance abuse as a covariate. Excludes substance abuse as a covariate.</p> <p>Four distinct hypotheses tested.</p> <p>Limitations:</p> <ul style="list-style-type: none"> Limited consideration of covariates. <p>Strengths:</p> <ul style="list-style-type: none"> Moves the literature forward on the relationships observed in prior studies between alcohol use and IPV. These authors sought to untangle the relationships that might exist among each partner's drinking patterns, social disorganization, and demographic variables. <p>Limitations:</p> <ul style="list-style-type: none"> Measurement of IPV is not specific, excludes certain types of violence, and is based on reports from one partner in each couple.

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Aklinnunnessa 2007 Bangladesh	Study design: Cross-sectional study Population: Ever-married men, aged 14–54, (n=2823 weighted and 3165 un-weighted) Data source: interviews from the 2004 Bangladesh Demographic and Health Survey	Outcomes: physical, sexual and overall IPV perpetration against wife in the last year Covariates: age, education, number of children, religion Predictors of interest: urban versus rural residence	Analytic method: Logistic regression analysis. Definitions: Neighborhood is conceived as individual residence being urban versus rural.	High rates of physical (68%), sexual (27%), and overall abuse (72%) reported. Urban residence was associated with a decreased likelihood of sexual violence perpetration (OR=0.80, 95%CI:[0.65–0.99]). Place of residence was not associated with physical violence or overall domestic violence.	Strengths: <ul style="list-style-type: none"> • Large sample size; • Setting in Bangladesh, where there have been few studies Limitations: <ul style="list-style-type: none"> • Implications of findings for the relationship between place and IPV is not discussed. • Little theoretical grounding for the exploration of place is included. • Potential bias in interviewing men, particularly inclusion of those no longer married. However, the high rates of abuse reported may indicate less bias.
Ackerson et al, 2008 India	Study design: Cross-sectional study Population: Married Indian women ages 15-49 (n=83,627). Data source: the 1998-99 Indian National Family Health Survey	Outcomes: physical IPV victimization in prior year or in lifetime (since age 15) Covariates: age, age at marriage, religion, social caste, standard of living, employment status, location of neighborhood (urban/rural), woman's education, husband's education, education differential Predictors of interest: community male/female literacy	Analytic method: Three-level multilevel model. Definitions: Neighborhood defined as primary sampling units; also includes districts and states.	Odds of recent IPV among women without education were 5.61 times (CI: 3.53,8.92) those of college-educated women. OR 1.84 for wives of college-educated men; OR 1.18 (CI: 1.44,2.35) for women with more education than their husband (CI: 1.05,1.33). After controlling for individual factors, literacy levels were inversely associated with IPV (ORs 1.10 to 1.14 for lowest tertile neighborhoods).	Strengths: <ul style="list-style-type: none"> • Strong data set. • Appropriate use of multilevel modeling and sound choices of variables. Limitations: <ul style="list-style-type: none"> • Although the study addresses the education of women as a risk factor, the introduction does not contain much material on theories upon which hypotheses are based • The Discussion section describes possible pathways, but these are relatively thin compared to other studies and focus largely on material interests, rather than the relative role of women in society. • Moreover, they do not fully address how neighborhood-level literacy works as an element of this pathway.

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Ackerson and Subramanian, 2008 (L. K. Ackerson & Subramanian, 2008) India	Study design: Cross-sectional study Population: Married Indian women ages 15-49 (n=83,627) Data source: the 1998-99 Indian National Family Health Survey	Outcomes: physical IPV victimization in prior year or in lifetime (since age 15) Covariates: age, age at marriage, religion, social caste, standard of living, employment status, location of neighborhood (urban/rural), woman's education, husband's education, education differential Predictors of interest: neighborhood wealth, per capita state domestic product, state gender equality, state human development	Analytic method: Multilevel modeling. Definitions: Neighborhood defined as primary sampling units. Also includes states.	State-level gender equality inversely associated with individual likelihood of recent IPV (OR=0.75). Neighborhood wealth, per capita state domestic product, and state human development were non-significant.	Strengths: <ul style="list-style-type: none"> The only paper to explicitly examine gender equality Strong analytical approach and consideration of three hierarchical levels of influence Limitations: <ul style="list-style-type: none"> The geographical area for which gender equality is measured is the state, not a smaller neighborhood or community level unit.
Stueve and O'Donnell 2008 Brooklyn, NY, USA	Design: Cross-sectional study Population: African American and Latina women, ages 19-20 (n=550). Data source: the Reach for Health Study	Outcomes: physical, sexual or emotional IPV victimization or perpetration Covariates: age, education, parenting, Hispanic, ethnic identity, discrimination, eight grade risk behaviors (aggression, alcohol use, lifetime sex) Predictors of interest: community violence experiences	Analytic method: Logistic regression modeling. Definitions: Neighborhood defined by individual self-report of neighborhood characteristics.	Community violence experience was significantly, positively associated with emotional IPV victimization (OR=1.26) and marginally, positively associated with physical IPV victimization (OR=1.13) and physical IPV perpetration (OR=1.13).	Strengths: <ul style="list-style-type: none"> Identifies linkage between experiences of community violence and individual partner violence. Limitations: <ul style="list-style-type: none"> Does not use a multilevel modeling framework.
Frye et al, 2008 New York City, USA (urban)	Design: Cross-sectional study Population: all femicides from 1990-1999, ages 16 and older (n=1861). Data sources: autopsy reports, crime scene and police reports, and additional documents containing demographic information	Outcome: intimate partner femicide (as compared to other types of femicide), classified using police report and information on victim-perpetrator relationship Covariates: age, foreign-born, race/ethnicity Predictors of interest: neighborhood educational/occupational attainment, immigrant concentration/isolation, external physical disorder, internal physical disorder, social cohesion, per capita income	Analytic method: Multilevel logistic regression modeling; compared intimate partner femicides to other femicides. Definitions: Neighborhood defined as the 59 residential community districts delineated by the New York City Office of City Planning.	No significant neighborhood-level effect identified, when controlling for neighborhood level per capita income.	Strengths: <ul style="list-style-type: none"> The first study to examine neighborhood level correlates with intimate partner femicide (IPF). Limitations: <ul style="list-style-type: none"> Comparison group is other femicides, so does not describe the influence of neighborhood conditions on risk of IPF, but the association between neighborhood conditions and the distribution of types of femicide, including IPF.

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
<p>Naved 2008 Bangladesh (one urban and one rural region)</p>	<p>Design: Cross-sectional study Population: ever-pregnant women age 15-49 (n=2553) Data source: a population-based survey associated with the WHO multi-country study on domestic violence</p>	<p>Outcome: physical IPV during any pregnancy Covariates: age, husband's education, whether woman earns an income, savings/credit group membership, marriage involving a dowry, in-laws live in household, reliance on natal family's support in a crisis, spousal communication, woman's mother abused by her father, husband's mother abused by his father, income, Muslim Predictors of interest: high concern about level of crime in the community</p>	<p>Analytic method: Multilevel regression model. Neighborhood defined as <i>mohollas</i> in the urban region and villages in the rural region. Neighborhood measures were aggregates of individual responses.</p>	<p>A higher proportion of adults in the community who worry about crime in their community is associated with a slightly increased likelihood of spousal violence during pregnancy (OR=1.09) in the urban region; no association was found in the rural region.</p>	<p>Strengths:</p> <ul style="list-style-type: none"> • Considers community level influences on violence against women in a developing country context. <p>Limitations:</p> <ul style="list-style-type: none"> • Considers only one community characteristic.
<p>Reed et al. 2009 Boston, USA (four urban community health centers)</p>	<p>Design: Cross-sectional study Population: African American men ages 18-65 who reported only female partners (n=569). Data source: surveyed as part of the Black and African American Men's Health Study</p>	<p>Outcomes: physical or sexual IPV perpetration in current heterosexual relationship Covariate: age (other covariates were explored in univariate analyses but did not meet inclusion criteria for the model) Predictors of interest: perceived frequency of violence in neighborhood, perceived need to fight to survive in neighborhood</p>	<p>Analytic method: Logistic regression modeling. Definitions: Neighborhood defined by individual self-report of neighborhood characteristics.</p>	<p>After adjusting for age, perceived frequency of neighborhood violence as "a great deal" (OR=3.1) or some/very little (OR=2.9) were associated with IPV, as compared to "none." Again adjusting for age, perceived need to fight to survive in neighborhood as "a great deal" (OR=2.0) or "some/very little" (OR=2.1) were associated with IPV, as compared to "none." In addition, involvement in street violence (OR=3.0) and gangs (OR=2.0) were associated with likelihood of IPV perpetration.</p>	<p>Strengths:</p> <ul style="list-style-type: none"> • Identifies linkage between experiences of neighborhood violence and gang membership and individual partner violence among African American men. <p>Limitations:</p> <ul style="list-style-type: none"> • Does not use a multilevel modeling framework.
<p>Caetano et al. 2009 USA (48 contiguous states)</p>	<p>Design: Cross-sectional study Population: married or cohabiting couples in the 48 contiguous united states (n=1025 couples). Data source: interviewed face to face as part of a random probability sample representative of married and cohabiting couples</p>	<p>Outcome: physical IPV occurrence during prior year (male to female and female to male, victimization and perpetration) Covariates: average weekly alcohol consumption, binge drinking, race, ethnicity, age, income Predictors of interest: neighborhood education, unemployment, working class composition; average of couples' perceived social cohesion and perceived informal social control</p>	<p>Analytic method: Path analysis. Definitions: Neighborhood defined as 2000 US Census Tract.</p>	<p>Neighborhood poverty was significantly correlated with IPV in unadjusted analysis, but the paths via social cohesion and perceived social control were non-significant.</p>	<p>Strengths:</p> <ul style="list-style-type: none"> • Incorporates the notion of stress as part of the pathway linking neighborhoods to outcomes, and incorporates Sampson's (1997) concept of social control/social cohesion at the Census Tract level. • Also incorporates Gelles' (1985) social-structural theory, which has previously been applied to child maltreatment as well. <p>Limitations:</p>

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Cumradi 2009 USA	Design: Cross-sectional study Population: married/cohabiting adults age 18 years and older who identified as Hispanic Data source: the 2000 National Household Survey on Drug Abuse (n=2,547).	Outcome: physical IPV victimization or perpetration in prior year Covariates: age, education, employment, income, born in US, survey language preference, binge drinking in past month, alcohol abuse in past year Predictor of interest: perceived neighborhood disorder	Analytic method: Logistic regression modeling accounting for multistage, multi-cluster sampling strategy. Neighborhood defined by individual self-report of neighborhood characteristics.	For men, neighborhood disorder was associated with increased IPV perpetration (OR=1.55) and victimization (OR=1.36); for women, neighborhood disorder was associated with IPV victimization (OR=1.34), but not perpetration.	Strengths: <ul style="list-style-type: none"> Incorporated a sophisticated and well-validated measure of alcohol use that considers past-year use, past-month binge drinking, and number of past-year drinking days (although the latter is subject to recall bias). consider "acculturation" of Hispanic immigrants Limitations: <ul style="list-style-type: none"> acculturation is measured only by nativity of respondent and language of interview.
Raghavan et al. 2009 Large public university (urban)	Design: Cross-sectional study Population: male undergraduate students at a large, public, urban university with a primarily low-income, immigrant or ethnic minority student body (n=479). Data source: survey conducted in a classroom setting	Outcome: physical IPV perpetration in prior year Covariates: race, ethnicity, male network violence, female network victimization Predictors of interest: community violence	Analytic method: Hierarchical logistic regression modeling. Definitions: Neighborhood defined by individual self-report of neighborhood characteristics.	Community violence was significantly, positively associated with IPV; male network violence mediated and moderated the relationship between community violence and IPV. Associations differed by race and ethnicity.	Strengths: <ul style="list-style-type: none"> Examines influence of community violence and social network violence on male perpetration of IPV. Strong theoretical and conceptual grounding. Limitations: <ul style="list-style-type: none"> Study population is male undergraduate students, limiting generalizability to other populations.
McKinney et al. 2009 USA (national)	Design: Cross-sectional study Population: couples aged 18 years and older in the 48 contiguous US states in 1995 (n=1,597 couples). Data source: face-to-face, national, population-based survey of couples aged	Outcome: physical and sexual IPV occurrence in prior year (male to female and female to male violence) based on the CTS Covariates: male and female age, education, employment status, and history of illicit drug use, couple level ethnicity, income, and marital status Predictors of interest: neighborhood poverty,	Analytic method: Regression modeling, controlling for clustering using a survey sampling adjustment. Neighborhood defined as 1990 US ZIP code.	Alcohol outlet density (OR=1.3), poverty (OR=1.3) and owner occupancy (1.2) were associated with an increased risk of male to female partner violence; only owner occupancy (OR=1.3) was associated with increased female to male partner violence.	Strengths: <ul style="list-style-type: none"> One of few studies to examine alcohol outlet density in a multilevel framework. Also considers male to female and female to male IPV, as well as additional neighborhood level factors. Limitations:

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Boyle et al, 2009 India	Design: Cross sectional study Population: women ages 15-49 who were usual residents in the household, married, and living with their spouse Data source: National Family Health Survey, 1998-1999, (n=68,466).	Outcome: physical IPV victimization in prior year Covariates: woman's age, family structure, number of children, working outside the home, exposure to physical mistreatment other than IPV since age 15, education, acceptance of mistreatment, and family structure Predictors of interest: neighborhood level women's education, household standard of living, attitudes acceptant of partner mistreatment, urban residence	Analytical method: Multilevel logistic regression. Definitions: Neighborhood defined as primary sampling units. Also includes state.	Acceptance of mistreatment (OR=1.19) and urban residence (OR=1.17) at the community level are significantly, positively associated with IPV victimization when controlling for all available covariates. Community-level women's education is significantly, negatively associated with IPV when controlling only for community-level acceptance of mistreatment and individual education and mistreatment, but is rendered non-significant by the inclusion of additional covariates.	Strengths: <ul style="list-style-type: none">• These authors went farther than others to delineate the theory about the relationship between women's education and IPV. They note that higher education is associated with more liberal societal norms, including gender equality. Limitations: <ul style="list-style-type: none">• Measurement of IPV is very general and no information is available to characterize the reliability and validity of the measures used.
Obasaju 2009 A university-affiliated public hospital in the US	Design: Cross-sectional study Population: African American women who reported clinical levels of abuse during childhood (n=98). Data source: a study of IPV and child adjustment within 152 African American families	Outcome: physical IPV victimization in prior year, using the Index of Spousal Abuse Covariates: childhood abuse (emotional, physical or sexual) Predictors of interest: community cohesion, perceived neighborhood disorder (considered as moderators)	Analytic method: Hierarchical, binary logistic regression analysis. Neighborhood defined by individual self-report of neighborhood characteristics.	Decreased levels of community cohesion and increased levels of perceived neighborhood disorder were associated with increased likelihood of adult physical IPV. Community cohesion and perceived neighborhood disorder moderate the relationship between childhood emotional abuse and adult physical IPV, with the relationship dependent on levels of both child emotional abuse and community cohesion or neighborhood disorder.	Strengths: <ul style="list-style-type: none">• Examines the relationship between neighborhood factors and IPV victimization, as related to childhood abuse.• The relationships between levels of child abuse and levels of both community cohesion and neighborhood disorder – as they influence adult IPV victimization – are closely examined. Limitations: <ul style="list-style-type: none">• Few covariates are considered.
Li et al, 2010 Jefferson County, Alabama, USA (urban)	Design: Cross-sectional study Population: pregnant women ages 14+ attending prenatal care clinics (n=2887). Data source: Perinatal Emphasis Research Center (PERC2) project	Outcomes: male partner-perpetrated physical violence during pregnancy, physical or sexual IPV in prior year, from Abuse Assessment Screening tool Covariates: age, age at first vaginal intercourse, education, Mastery, no paying job, use of alcohol, African American, performed most of	Analytic method: Multilevel logistic regression modeling. Definitions: Neighborhood is defined as 2000 US Census Tract.	Residential stability was significantly associated with increased IPV risk (OR=4.29). Concentrated disadvantage index and violent crime were non-significant.	Strengths: <ul style="list-style-type: none">• Considers neighborhood influences on violence against women during pregnancy.• Considers numerous covariates, including gender empowerment and role variables.• Some consideration of theory.

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Uthman et al 2011 Nigeria (national)	Design: Cross-sectional study Population: currently married or cohabiting women ages 20-44 (n=8731). Data source: interviewed as part of the Nigerian Demographic and Health Survey 2008	housework, unmarried, use of housework, unmarried, use of welfare Predictors of interest: neighborhood concentrated disadvantage, residential stability, neighborhood violent crime Outcome: lifetime physical, sexual or emotional IPV, using a version of the Conflict Tactics scale. Covariates: witnessed physical violence in childhood, tolerance of IPV Predictors of interest: community level proportion of women tolerant of IPV, community level proportion of men tolerant of IPV, community level proportion of respondents that witnessed physical violence in childhood	Analytical method: Multilevel structural equation model. Definitions: Neighborhood defined as primary sampling units.	A higher proportion of women in the community with attitudes tolerant of IPV was associated with sexual and emotional abuse, but not physical abuse, while a higher proportion of men with tolerant attitudes was associated with physical abuse, but not emotional or sexual abuse.	Limitations: <ul style="list-style-type: none"> Sample is drawn from women attending clinics of a county department of health, which may limit generalizability. Strengths: <ul style="list-style-type: none"> First study to examine neighborhood influences in Africa. Uses a multilevel structural equation model. Based on a conceptual model with specific hypotheses to be tested. Considers potential mediation. Limitations: <ul style="list-style-type: none"> Examines community level attitudes, but does not take into account other community level variables, such as socioeconomic disadvantage.
Emery et al. 2011 Chicago, USA	Design: Longitudinal study Population: primary caregivers of children in Chicago, primarily women (n=599). Data source: Project on Human Development in Chicago Neighborhoods Longitudinal survey	Outcome: desistance from physical IPV, measured using items from the CTS Covariates: respondent's race and education, number of children and type of IPV initially reported. Group 1: child/was upset in front of the child in the past week, total personal income, total household income, adult family member threatened to hit child, worries about not having enough money, number of times in last year got information tobacco up his/her position during an argument with partner, child's father's education, can afford to buy more or less than last year, number of years resided at current address, age of child's father.	Analytic method: Logistic regression model correcting for clustering within neighborhoods. Definitions: Neighborhood defined by Chicago neighborhood boundaries, which are constructed of 1990 US Census Tracts. Some neighborhood measures are defined as averaged responses from the PHDCN community survey.	Participants living in neighborhoods high in illegal cynicism had lower odds of reporting IPV desistance (OR=0.24); other neighborhood characteristics were not associated with IPV desistance. Separate models account for two groups of covariates (shown in variables column), and did not affect conclusions regarding neighborhood predictors.	Strengths: <ul style="list-style-type: none"> This is the first study to investigate the relationship between neighborhood characteristics and IPV desistance. They emphasize that desistance is one important way to reduce the burden of IPV. The inclusion of neighborhood level legal cynicism is innovative and could have important policy implications. Limitations: <ul style="list-style-type: none"> Data was over ten years old when analyzed for this paper.

Citation/setting	Study design/data source(s)	Variables	Analytical approach	Results/conclusions	Strengths and limitations
Waller 2011 USA (national)	Design: Cross-sectional study Population: individuals age 18-26 years old (n=14,322) Data source: Wave III of the National Longitudinal Study of Adolescent Health, 2001-2002	Outcomes: physical or sexual IPV victimization in prior year Covariates: age, race/ethnicity, marital status, childhood neglect, physical abuse, and sexual abuse, and alcohol use Predictors of interest: neighborhood alcohol outlet density, neighborhood poverty, transience, proportion foreign born, and proportion of vacant housing units	Analytic method: Logistic regression and structural equation modeling. Definitions: Neighborhood defined as 2000 US Census Tract.	Alcohol outlet density was not a significant predictor of IPV victimization. Neighborhood transience was associated with a decreased likelihood of physical IPV, and neighborhood poverty was associated with an increased likelihood of sexual only or physical and sexual IPV.	conceives of place as an individual characteristic inst conceives of place as an individual characteristic inst conceives of place as an individual characteristic inst conceives of place as an individual characteristic inst et al. Strengths: <ul style="list-style-type: none"> Strong conceptual foundation. Considers numerous predictors and covariates. One of few studies considering the relationship between the physical availability of alcohol and IPV risk. Limitations: <ul style="list-style-type: none"> Co-occurrence of IPV and alcohol use was not assessed.

Married/cohabiting adults age 18 years and older who identified as Hispanic and participated in the 2000 National Household Survey on Drug Abuse (n=2,547)

Table 2
Associations Between Neighborhood Environment and Intimate Partner Violence Risk,
Organized by Domains

Construct measured	Single-level models	Multi-level models/Models accounting for clustering
<i>Demographic and Socioeconomic Neighborhood Composition</i>		
Higher area unemployment rate		1 significant, positive association (O'Campo, Burke, Peak, McDonnell, & Gielen, 2005)
Lower area level per-capita, or median family or household income	1 significant, positive association (using Cox regression model) (Mears, Carlson, Holden, & Harris, 2001)	1 significant, positive association (O'Campo, et al., 2005)
Lower owner occupancy		2 significant, negative associations (McKinney, Caetano, Harris, & Ebama, 2009); No association (O'Campo, et al., 2005)
Higher proportion of single female headed households with children	1 significant, positive association (Lauritsen & Schaum, 2004)	
Higher proportion of households with children age 18 or younger	1 significant, positive association (Lauritsen & Schaum, 2004)	
Lower neighborhood wealth (standard of living)		No association (Ackerson & Subramanian, 2008)
Higher proportion Black residents	No association (Lauritsen & Schaum, 2004)	
Lower educational/occupational attainment		No association with IPF, when compared to other femicides (Frye et al., 2008)
Higher immigrant or foreign-born concentration		No association found (Browning, 2002; Waller et al., 2011); No association with IPF, when compared to other femicides (Frye, et al., 2008)
Higher proportion of vacant housing		No association (Waller, et al., 2011)
<i>Human and Economic Development</i>		
Lower community economic index (derived from presence of 7 types of institutions in neighborhood)		No association (Michael A. Koenig, Ahmed, Stephenson, Jejeebhoy, & Campbell, 2006)
Lower percentage of community households with electricity		No association (Michael A. Koenig, et al., 2006)
Lower state-level GDP		No association (Ackerson & Subramanian, 2008)
Lower state-level human development		No association (Ackerson, Kawachi, Barbeau, & Subramanian, 2008)
Lower neighborhood male literacy		1 significant, positive association (Ackerson, et al., 2008)
<i>Social Disorganization Theory</i>		
Higher level of concentrated poverty/disadvantage	2 significant, positive association (Benson, Fox, DeMaris, & van Wyk, 2003; DeMaris, Benson, Fox, Hill, & Van Wyk, 2003); 1 significant, positive association when race is not included (Van Wyk, Benson, Fox, & DeMaris, 2003); 1 significant positive association that reduces the OR for race (Benson, Wooldredge, Thistlethwaite, & Fox, 2004); 1 significant, negative association (Lauritsen & Schaum, 2004); no	2 significant, positive associations (McKinney, et al., 2009; Waller, et al., 2011); 1 significant, positive association (only black couples for male to female violence)(C. B. Cunradi, Caetano, Clark, & Schafer, 2000); no association found (Browning, 2002; Emery, Jolley, & Wu, 2011; Michael A. Koenig, et al., 2006; Li et al., 2010); for White and Hispanic couples male to female and four all races female to male, no association found (C. B. Cunradi, et al., 2000; Waller, et al., 2011); no differential

Construct measured	Single-level models	Multi-level models/Models accounting for clustering
	association (DeMaris, et al., 2003)	association for IPF as compared to other femicides (Frye, et al., 2008)
Higher level of residential mobility/instability	1 significant, negative association (Benson, et al., 2003)	2 significant, negative associations (Li, et al., 2010; Waller, et al., 2011); No association found (Browning, 2002; Emery, et al., 2011; Waller, et al., 2011)
Lower level of collective efficacy	1 significant, positive association (Dekeseredy, Schwartz, Alvi, & Tomaszewski, 2003)	1 significant, positive association (Browning, 2002); no association (Emery, et al., 2011)
Stronger norms supporting non-intervention		1 significant, positive association (Browning, 2002)
Lower level of social cohesion/social control		1 significant, positive association (Obasaju, Palin, Jacobs, Anderson, & Kaslow, 2009); No association with IPF, when compared to other femicides (Frye, et al., 2008); no mediating effect for relationship between neighborhood disadvantage and IPV (Caetano, Ramisetty-Mikler, & Harris, 2009)
Higher perceived neighborhood disorder	No association (Dekeseredy, et al., 2003; Raghavan, Mennerich, Sexton, & James, 2006)	5 significant, positive associations (Carol B. Cunradi, 2007; C. B. Cunradi, 2009; Obasaju, et al., 2009); No association (C. B. Cunradi, 2009); significant, positive interaction with drinking level (Carol B. Cunradi, 2007)
Higher external physical disorder		No association with IPF, when compared to other femicides (Frye, et al., 2008)
Higher internal physical disorder		No association with IPF, when compared to other femicides (Frye, et al., 2008)
Higher ethnic heterogeneity		No association (Emery, et al., 2011)
Higher legal cynicism		1 significant, positive association (Emery, et al., 2011)
<i>Community Violence</i>		
Higher community murder/crime rate		2 significant, positive associations (physical and sexual violence) (Michael A. Koenig, et al., 2006); No association (Li, et al., 2010)
Higher perceived frequency of neighborhood violence	1 significant, positive association (Reed et al., 2009); no association (Dekeseredy, et al., 2003)	
Higher perceived need to fight to survive in neighborhood	1 significant, positive association (Reed, et al., 2009)	
Higher level of experience/exposure with/to community violence	2 significant, positive associations (Raghavan, et al., 2006; Stueve & O'Donnell, 2008); 2 marginally significant associations (Stueve & O'Donnell, 2008); no association (Stueve & O'Donnell, 2008)	1 significant, positive association (C. Raghavan, V. Rajah, K. Gentile, L. Collado, & A. M. Kavanagh, 2009)
Higher perceived neighborhood drug problems	No association (Dekeseredy, et al., 2003)	
Higher level of worry about crime in community		1 significant, positive association (only in urban region) (Naved & Persson, 2008); No association (Naved & Persson, 2005); no association (in rural region)(Naved & Persson, 2008)
<i>Prevalence/Acceptance of IPV</i>		
More prevalent community wife-beating or coerced sex norms/reports		7 significant, positive associations (2 are for PSU and district level effects in Koenig et al. study, 3 are from Uthman et al. study) (Michael A. Koenig, et al., 2006;

Construct measured	Single-level models	Multi-level models/Models accounting for clustering
		McQuestion, 2003; Uthman, Moradi, & Lawoko, 2011); no association (Uthman, et al., 2011)
Higher level of social network violence	2 significant, positive associations (Raghavan, et al., 2006; Chitra Raghavan, Valli Rajah, Katie Gentile, Lillian Collado, & Ann Marie Kavanagh, 2009)	
<i>Women's Empowerment</i>		
Lower proportion of community women in savings/ credit groups		1 significant, positive association (Jessore area) (M. A. Koenig, Ahmed, Hossain, & Khorshed Alam Mozumder, 2003); No association (Sirajgonj area) (M. A. Koenig, et al., 2003)
Lower level of women's autonomy		1 significant, positive association (Jessore area) (M. A. Koenig, et al., 2003); No association (Sirajgonj area) (M. A. Koenig, et al., 2003)
Lower community/neighborhood female education/ literacy		1 significant, positive association (Ackerson, et al., 2008); 1 significant, positive association when only minimal covariates considered and no association when fully adjusted (Boyle, Georgiades, Cullen, & Racine, 2009); no association (M. A. Koenig, et al., 2003; Michael A. Koenig, et al., 2006)
Stronger gender norms supporting women's subservience to men		No association (Michael A. Koenig, et al., 2006; Naved & Persson, 2005)
Lower level of gender equality		1 significant, positive association (Ackerson & Subramanian, 2008)
<i>Urbanicity/Rurality and Regionalization</i>		
Increasing rurality/decreasing urbanicity	3 significant, positive associations (Aklimunnessa, Khan, Kabir, & Mori, 2007; Antai, 2011; Flake, 2005); 1 significant negative association (Abeya, Afework, & Yalew, 2011); no association (Aklimunnessa, et al., 2007; Antai, 2011; Lauritsen & Schaum, 2004)	
Regional differences	2 significant differences (Flake, 2005; M. A. Koenig, et al., 2003)	
<i>Alcohol Outlet Density</i>		
Higher alcohol outlet density		1 significant, positive association (McKinney, et al., 2009); no association (Waller, et al., 2011)

* Positive associations indicate that the variable increases the likelihood of IPV/IPF. Constructs are stated in the direction of the hypothesized effect that would increase IPV risk.

Table 3
Pathways by which Neighborhood Environment is Hypothesized to Influence Intimate Partner Violence Risk: Questions for Future Research

Demographic and Socioeconomic Neighborhood Composition
Low levels of income, educational or occupational attainment, and home ownership create dissatisfaction, stress and rage, which increase the likelihood of intimate violence.
Ethnic heterogeneity within neighborhoods impedes communication among residents, weakening social ties, reducing the likelihood that neighbors intervene to stop intimate violence.
Human and Economic Development
Low levels of human and/or economic development create situations of socioeconomic distress, creating dissatisfaction, stress and rage, which increase the likelihood of intimate violence.
Few community resources, such as domestic violence intervention programs, are available, decreasing awareness of domestic violence as a deviant behavior and increasing the likelihood of its perpetration.
Few community resources, such as domestic violence intervention programs, are available, decreasing the likelihood of intervention to stop violence.
Social Disorganization Theory
Concentrated socioeconomic disadvantage limits social ties, which increases social isolation, simultaneously limiting a victim's ability to call upon resources to prevent or end intimate violence, and increasing her dependence on the aggressor.
Concentrated socioeconomic disadvantage increase levels of stress, increasing the likelihood that a male partner will resort to violence.
Conditions of concentrated disadvantage signal that social control is limited, thereby encouraging intimate violent acts with the promise of impunity.
Residential instability loosens social ties and reduces collective efficacy, preventing neighbors from acting collectively to curb violence, including violence in private settings.
Residential stability, coupled with disadvantage, deepens and prolongs the experience of disadvantage, thereby increasing the risk of intimate violence.
Physical disorder/deterioration signal ambivalence about violence, or inability of neighbors to enforce social controls, increasing the likelihood of intimate violence.
Norms supporting non-intervention in a neighbor's affairs reduce a neighbor's likelihood of intervening to prevent or stop violence.
Community Violence and Prevalence/Acceptance of IPV
High levels of community and/or social network violence signal that social control is limited, thereby encouraging intimate, violent acts with the promise of impunity.
High levels of community and/or social network violence normalize and/or legitimize violence as a form of conflict resolution, thereby encouraging intimate violent acts with the promise of impunity.
Empowerment of Women
Predominance of patriarchal notions of female subservience legitimize violence against women, thereby encouraging intimate violent acts with the promise of impunity.
Predominance of patriarchal notions of the male as breadwinner, in combination with situations of disadvantage and male unemployment or unstable employment, increases male rage and feelings of need to dominate his female partner through acts of intimate violence.
Predominance of notions of privacy and stoicism limit the likelihood of neighbors intervening to stop intimate violent acts.
General subjugation of women supports the notion that women can be controlled through violence.
Cultural acceptance of violence as conflict resolution, and/or violence against women, increases the likelihood that intimate violence will occur.
Urbanicity/Rurality and Regionalization
Women in rural areas may be at an increased risk of violence due to geographic isolation, which hides violence and prevents interventions to stop violence.
Regions distinct in culture or economic activity may have differences in prevalence of intimate violence.
Alcohol outlet density
Alcohol availability encourages alcohol use, thereby increasing the likelihood of intimate violence.

Alcohol outlets provide locations for at-risk individuals to congregate, thereby reinforcing problem attitudes and behaviors and increasing the likelihood of intimate violence.

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Table 4
Implications for Policy and Practice

Policy or Practice Implication	Research Supporting Implication
Efforts to reduce overall levels of neighborhood disadvantage may reduce rates of IPV	(Benson, Fox, DeMaris, & van Wyk, 2003; Benson, Wooldredge, Thistlethwaite, & Fox, 2004; C. B. Cunradi, Caetano, Clark, & Schafer, 2000; DeMaris, Benson, Fox, Hill, & Van Wyk, 2003; McKinney, Caetano, Harris, & Ebama, 2009; Van Wyk, Benson, Fox, & DeMaris, 2003; Waller et al., 2011)
Efforts to increase levels of neighborhood collective efficacy may reduce rates of IPV	(Browning, 2002; Dekeseredy, Schwartz, Alvi, & Tomaszewski, 2003)
Efforts to reduce levels of neighborhood disorder may reduce rates of IPV	(Carol B. Cunradi, 2007; C. B. Cunradi, 2009; Obasaju, Palin, Jacobs, Anderson, & Kaslow, 2009);
Efforts to reduce community levels of crime and violence may reduce rates of IPV	(Dekeseredy, et al., 2003; Michael A. Koenig, Ahmed, Stephenson, Jejeebhoy, & Campbell, 2006; Naved & Persson, 2008; Raghavan, Mennerich, Sexton, & James, 2006; C. Raghavan, V. Rajah, K. Gentile, L. Collado, & A. M. Kavanagh, 2009; Reed et al., 2009; Stueve & O'Donnell, 2008)
Efforts to reduce cultural norms supporting violence against women, including dissemination via social networks, may reduce IPV, particularly in developing country contexts	(Michael A. Koenig, et al., 2006; McQuestion, 2003; Raghavan, et al., 2006; Chitra Raghavan, Valli Rajah, Katie Gentile, Lillian Collado, & Ann Marie Kavanagh, 2009; Uthman, Moradi, & Lawoko, 2011)
Efforts to educate and empower women may reduce rates of IPV, particularly in developing country contexts	(Ackerson & Subramanian, 2008; Boyle, Georgiades, Cullen, & Racine, 2009; M. A. Koenig, Ahmed, Hossain, & Khorshed Alam Mozumder, 2003);
Efforts to address problems of geographic and social isolation associated with rural environments may reduce rates of IPV	(Aklimunnessa, Khan, Kabir, & Mori, 2007; Antai, 2011; Flake, 2005)