

analysis of 33 studies suggests that men with histories of IPV are higher on anger and hostility than individuals without IPV histories across self-report, observational, and spouse-specific measures (i.e., anger directed by a male at his spouse and not some other target: Norlander & Eckhardt, 2005). This difference between men with and without histories of IPV holds even when controlling for relationship distress. Hostility has also been shown to predict IPV over time (Schumacher, Homish, Leonard, Quigley, & Kearns-Bodkin, 2008; White & Widom, 2003).

Another clear risk factor for IPV is substance use. Two separate reviews have concluded that alcohol and drug use increase the likelihood of IPV among men, though the association has been shown more clearly for alcohol than other drugs, and may depend on drug type (Moore et al., 2008; Shorey et al., 2011). IPV is between 2 and 11 times more likely to occur under conditions of drinking (Moore, Elkins, McNulty, Kivisto, & Handsel, 2011). Additionally, individuals given alcohol exhibit increases in anger expression and aggression verbalization in the laboratory, with increases being more dramatic for maritally violent than maritally nonviolent men (Eckhardt, 2007). Thus, it seems clear that intoxication is a major factor that sets the stage for IPV occurrences.

Substance use may represent a mediating factor by which hostility leads to IPV. Certainly, greater hostility is linked with more drug and alcohol use (Calhoun, Bosworth, Siegler, & Bastian, 2001; Hamdan-Mansour, Halabi, & Dawani, 2009; Hampson, Tildesley, Andrews, Luyckx, & Mroczek, 2010; Putt, Dowd, & McCormick, 2001). Additionally, longitudinal studies indicate that changes in hostility predict changes in substance use severity over time, implying that differences in hostility explain differences in substance use severity and not the other way around (Putt et al., 2001). Furthermore, both male and female substance users who report high hostility are more likely to utilize drugs in response to interpersonal and familial conflicts, and to resort to confrontational coping styles to deal with these conflicts (McCormick & Smith, 1995). These studies imply that individuals high in hostility may more frequently use drugs and alcohol, which may put them at greater risk for engaging in IPV. It is also possible that hostility and substance use have interactive effects, such that individuals high in both these traits will engage in more IPV than those low in either or both traits. Indeed, one study revealed that high alcohol use and more hostile temperament interacted to predict alcohol-related aggression over time among newlywed couples for both husbands and wives (Kachadourian, Homish, Quigley, & Leonard, 2012).

Hostility, Substance Use, and Parenting

IPV has effects beyond its economic impact and the distress caused for victims and child witnesses. For

example, IPV can have an influence on parenting behavior. Experiencing or engaging in IPV is a risk factor for harsh parenting (e.g., sarcastic tone, threatening or punishing without explanation); intrusive parenting (e.g., lack of respect for the child as an individual, interfering with the child's needs; Gustafsson & Cox, 2012; Postmus, Huang, & Mathisen-Stylianou, 2012); reduced parenting and co-parenting capability (Baker, Perilla, & Norris, 2001; Casanueva, Martin, Runyan, Barth, & Bradley, 2008; Kan, Feinberg, & Solmeyer, 2012; Murray, Bair-Merritt, Roche, & Cheng, 2012); and child maltreatment (Payne, Higgins, & Blackwell, 2010; Taylor, Guterman, Lee, & Rathouz, 2009).

Given the high co-occurrence of IPV and child maltreatment (Edelson, 1999; Hamby et al., 2010), it is possible that hostile-aggressive parenting shares a similar relationship with hostility and substance use as IPV. Indeed, parental hostility predicts harsher parenting and emotional unavailability (Buehler, Benson, & Gerard, 2006; Rhoades et al., 2011; Sturge-Apple, Davies, & Cummings, 2006). Additionally, substance use is associated with neglectful and hostile-aggressive parenting (Dunn et al., 2002; Stover, Urdahl, & Easton, 2012), more negative father-child interactions (Eiden, Chavez, & Leonard, 1999), less responsible fathering in terms of delivery of economic resources, patterns of procreation, pair-bonding, and parenting (McMahon, Winkel, & Rounsaville, 2008), and lower reflective functioning (Borelli, West, Decoste, & Suchman, 2012; Stover & Kiselica, in press). Thus, in a similar vein to IPV, parents high in hostility may be led to engage in more hostile-aggressive parenting behavior as a result of their use of substances. The effect of hostility on parenting may also be moderated by substance use, such that those high in hostility and substance use may engage in poorer parenting than those low in either or both of these characteristics.

Current Study

The purpose of the current study was to investigate mediation models predicting IPV and negative parenting behavior from hostility and substance use in a sample of fathers. We hypothesized that substance use would mediate the relationship between hostility and both physical and psychological partner violence, as well as hostile-aggressive and rejecting parent behavior. We also explored moderated-mediation models to look for interactive effects of hostility and substance use on IPV and negative parenting.

METHODS

Participants

The participants in the study were 132 fathers recruited for the Comparative Study on Fathering (Stover, Easton,

& McMahon, 2013). This study was designed to examine the parenting of men with IPV and substance use histories and those without these problems. A number of participants (36.80%) had co-occurring IPV and substance abuse histories. Some participants (8.33%) reported IPV only, 21.21% reported substance abuse only, and the remaining 33.67% of the fathers had neither problem. The participants reported using many different drugs, including alcohol (63.9%), marijuana (28.5%), opiates (4.6%), sedatives (4.6%), hallucinogens (3.0%), cocaine (2.4%), inhalants (2.3%), and amphetamines (0.8%). The fathers mean age was 34.56, and ages ranged from 20 to 52. They reported their racial/ethnic backgrounds as African American (55.7%), White/Caucasian (17.7%), Hispanic (15.2%), Mixed (8.0%), and other (1.3%). A large portion of the sample was unemployed (46.8%). Finally, 46.8% of the sample lived with their child, and fathers saw their children 20.30 ($SD = 9.63$) days a month on average. Their children ranged in age from 2 to 6 years. Fathers with children of this age were targeted for recruitment given that families impacted by IPV often have younger children (Hamby, Finkelhor, Turner, & Ormrod, 2010; Fantuzzo & Mohr, 1999), fathers are more likely to be involved when children are younger, young children are most affected by IPV and negative parenting (Shonkoff & Meisels, 2000) and the broader study included a measure of child behavioral functioning which was designed for early childhood (aged 2–6 years).

Measures

Fathers completed a series of demographic and family history questions and standardized measures of IPV and parenting.

The Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) is a self-report measure of participants' use of violence in the last year and over the course of the relationship with their partner. In this study, fathers were asked to report violence in their relationship with the mother of the target child. The CTS2 was used to assess the presence of both physical and psychological IPV in the last 12 months on the part of the mother and father. Because we only collected data on fathers' hostility and substance use and the focus of our study is on father-initiated IPV and aggressive parenting, only male initiated violence scores are used in the analyses. It is important to note, however, that fathers did report much mother initiated violence (physical violence [$M = 6.69$, $SD = 9.24$]; psychological aggression [$M = 15.60$, $SD = 10.06$]). The CTS2 is the most commonly used self-report measure for assessing IPV in the research literature. In this sample, internal consistencies of the physical and psychological IPV scales were .92 and .89, respectively.

The Parental Acceptance Rejection Questionnaire (PARQ; Rohner, Khaleque, & Cournoyer, 2005) documents the frequency of rejecting and hostile-aggressive parenting. Respondents rate how frequently they engage in rejecting (not showing love, affection, or care to the child) or aggressive (violent or harsh actions directed toward the child) behavior toward their child from 0 ("Almost never true of me") to 3 ("Almost always true of me"). Examples of items that index rejecting parenting include, "I see my child as a big nuisance" and "When my child misbehaves, I make him/her feel unloved." Examples of items that index aggressive parenting include, "I yell at my child when I am angry" and "I hit my child even when (s)he may not deserve it." Each subscale consists of 15-items and each has demonstrated good convergent, discriminant, and construct validity, as well as internal consistency (Rohner et al., 2005). The PARQ has shown utility in multiple studies of fathers with IPV and substance abuse histories (McMahon et al., 2008; Stover et al., 2012, 2013). For this study, fathers were asked to rate the frequency of specific acts of parenting behavior occurring in their relationship with their oldest biological child between the ages of 2 and 6 years. In this sample, internal consistencies of the aggressive and rejecting parenting scales were .77 and .60, respectively.

The Addiction Severity Index 5th Edition (ASI; McLellan et al., 1992) is an interview assessing drug use and problems. From the ASI, we gathered frequency of alcohol and drug use in the past month, measured by number of days on which a substance was used. We summed across drug categories to obtain a measure of total substance use. The ASI has been validated in many different populations (Makela, 2004). Furthermore, reports of drug use on the ASI are correlated with drug use detection via urinalysis (Denis et al., 2012).

Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) is a 53-item self-report measure assessing multiple domains of symptoms. Items are rated on 5-point scale that ranges from 0 (never) to 4 (always). We used the hostility subscale of the BSI (example items include: "Feeling easily annoyed or irritated," and "Having urges to beat, injure, or harm someone"). The BSI has high internal consistency and convergent validity with other measures of psychological distress (Boulet & Boss, 1991). Internal consistency was .62 in the current sample.

Procedure

Fathers were recruited into the study by flyers posted in substance abuse treatment programs, health clinics, pediatric offices, the court house, domestic violence programs, unemployment offices, preschools, pediatric clinics, bus stops, libraries, and community agencies in New Haven, CT. Men were screened by phone for

eligibility (biological father of a child between 2 and 6 years of age with at least monthly visitation) and then met in person for a single 2-hr session with trained research assistants to complete informed consent and study measures. Recruitment was focused on collecting a sample of fathers of young children with at least half struggling with substance use and/or IPV. Data were collected regarding fathers' relationships and parenting behavior toward their oldest biological children aged 2 through 6 years. Participants were paid \$50 for their time and the study was approved by the Yale University School of Medicine Human Investigations Committee.

Data Analysis

We proposed that hostility would lead to increased IPV and poorer parenting via substance use. We tested for the significance of indirect effects of hostility on outcomes through substance use by using bootstrapping methodology (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). This procedure produces an empirical sampling distribution, consisting of 5,000 bootstrap samples, of the estimated indirect effect of the independent variable on the dependent variable through the proposed mediator. This sampling distribution is then used to provide an estimate of the indirect effects and a 95% confidence interval. Simulation studies have found that the bias-corrected bootstrap yields the most accurate confidence intervals (Cheung & Lau, 2008; MacKinnon, Lockwood, & Williams, 2004). Thus, we report bootstrap estimates and bias-corrected confidence intervals for each mediational relationship (Preacher & Hayes, 2008). For these analyses, confidence intervals for the estimate of the indirect effect that do not contain zero are considered significantly different from zero, indicating a meaningful

effect. When testing study hypotheses, we used two outcomes for IPV—physical and psychological IPV—and two outcomes for parenting—aggressive and rejecting parenting.

Because research suggested that being high in hostility and substance use could have an interactive effect on IPV and parenting, we added an interaction term (hostility \times substance use) to these models, using the Process macro for SPSS (Preacher & Hayes, 2008) to examine potential moderated-mediation relationships. Moderated mediation occurs when a mediated relationship is qualified by an interaction (Preacher, Rucker, & Hayes, 2007) in other words, the strength of the indirect effect depends on a moderator variable (note that in this case, the moderator variable is also the mediator variable).

RESULTS

We first examined all variables for outliers: None were detected. Means and standard deviations, as well as correlations, for all study variables are presented in Table I. As might be expected, the two IPV variables were highly correlated, as were the two parenting variables. Hostility and substance use were correlated with each other, as well as each of the outcomes variables.

Next, we examined bootstrap mediation models of hostility leading to IPV and poor parenting via substance use. These analyses yielded confidence intervals for the indirect effects that did not include zero (Table II). Thus, substance use mediated the relationship between hostility and all outcomes. In other words, individuals who were high in hostility engaged in substance use more often, leading them to more instances of physical and psychological IPV and more rejecting and aggressive parenting practices.

TABLE I. Means, Standard Deviations, Minimums, Maximums, and Correlations for Study Variables

Variable	Mean (SD)	Min.	Max.
Hostility	1.47 (0.52)	1	4
Substance use	7.81 (10.26)	0	48
Physical IPV	2.64 (4.37)	0	21
Psychological IPV	12.86 (8.77)	0	46
Parental rejection	6.37 (4.64)	1	26
Parental Aggression	4.75 (2.73)	1	19

	2.	3.	4.	5.	6.
1. Hostility	0.16	0.31***	0.30**	0.20*	0.34***
2. Substance use	—	0.26**	0.29**	0.31***	0.26**
3. Physical IPV	—	—	0.65***	0.51***	0.60***
4. Psychological IPV	—	—	—	0.37***	0.55***
5. Parental rejection	—	—	—	—	0.71***
6. Parental aggression	—	—	—	—	—

* $P < .05$.

** $P < .01$.

*** $P < .001$.

TABLE II. Results of Bootstrapped Mediation Analyses

Dependent Variable	B (SE) for IV to Mediator	B (SE) for Mediator to DV	B (SE) for IV to DV	Estimate of the Indirect Effect [CI _{95%}]	B for Hostility × Substance Use Interaction	Model R ^{2a}
Physical IPV	3.46 (1.76)	0.09** (0.04)	2.57*** (0.72)	0.31 [0.01, 1.19]	0.03	.13***
Psychological IPV	3.46 (1.76)	0.20** (0.07)	4.98** (1.43)	0.71 [0.05, 2.45]	0.14	.15***
Parental rejection	3.11 (1.73)	0.08*** (0.02)	0.75 (0.44)	0.26 [0.004, 0.78]	0.15***	.20***
Parental aggression	3.11 (1.73)	0.10* (0.04)	2.68*** (0.73)	0.33 [0.01, 1.25]	0.18*	.20***

Note. These analyses were also run controlling for days of child contact in the past month. Controlling for child contact did not change results, so results are reported without the effect of covariates.

^aFor models without significant interactions, R² values are reported for just the mediation model.

*P < .05.

**P < .01.

***P < .001.

The hostility by substance use interaction was not significant for either IPV outcome (see Table II), indicating that moderated-mediation was not present. However, the interaction was significant for both parenting outcomes, indicating a significant moderated-mediation effect (see Table II). The direct effect of this interaction is presented graphically in Figure 1: Individuals high in hostility and substance use were at greater risk for aggressive and rejecting parenting than those low on either or both of these variables. For the parenting outcomes, conditional indirect effects are presented in Table III: Indirect effects with confidence intervals that do not contain zero are considered significant. These results indicate that the mediated path from hostility to rejecting and aggressive parenting only occurs for those high in substance use.

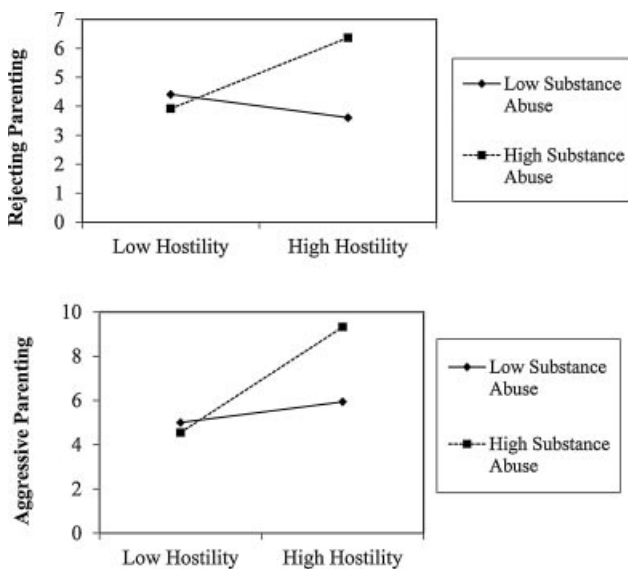


Fig. 1. Hostility × substance use interactions predicting rejecting and aggressive parenting.

We also tested an alternative relationship, whereby substance use led to IPV and poor parenting via hostility. This alternative mediation model was significant for all outcomes except rejecting parenting. This alternate finding indicates the directionality of the mediation is not clear. Given our hypotheses, we report findings from the original model, but acknowledge that the direction of effect remains uncertain.

DISCUSSION

This was the first study to examine the interrelationship of substance use with the influential characteristic of hostility in determining IPV and parenting outcomes. We proposed that substance use would mediate the relationship between hostility and both physical and psychological IPV, as well as rejecting and hostile-aggressive parenting behavior. Furthermore, we explored whether hostility and substance use might also have interactive effects on IPV and parenting behavior. There were several interesting findings.

First, substance use mediated the relationship between hostility and both physical and psychological IPV. This finding indicates that individuals who are more hostile

TABLE III. Conditional Indirect Effects of Hostility on Outcomes at Values of the Moderator

Outcome		Estimate of the Indirect Effect [CI _{95%}]
Parental Rejection	Low substance use ^a	0.19 [−0.59, 0.22]
Parental Aggression	High substance use ^b	2.00 [0.04, 1.12]
Parental Rejection	Low substance use ^a	0.30 [−0.98, 0.33]
Parental Aggression	High substance use ^b	0.41 [0.01, 1.80]

Note. These analyses were also run controlling for days of child contact in the past month. Controlling for child contact did not change results, so results are reported without the effect of covariates.

^a1 SD below the mean.

^b1 SD above the mean.

are more likely to engage in substance use, increasing the probability that they may become violent towards their partners. Research has clearly demonstrated that being under the influence of substances makes an individual more likely to engage in IPV (Moore et al., 2011). Thus, any trait that makes substance use more likely will enhance the possibility of IPV occurring. This mediated relationship held across all levels of substance use, with no interaction between hostility and substance use reaching significance. These findings are consistent with other studies that have found that men and women who abuse drugs and who endorse high levels of hostility are the most likely to be violent and those with high levels of hostility have more difficulty remaining abstinent from drugs at times of stress (Handelsman et al., 2000; McCormick & Smith, 1995). These connections suggest a cycle that requires interruption, whereby hostility can increase substance use, which may result in IPV.

In addition to IPV, substance use mediated the association between hostility and aggressive and rejecting parenting. This result indicates that those higher in hostility are more likely to use substances, leading them to engage in poorer parenting practices (e.g., spanking, yelling, ignoring the child) that may represent child maltreatment. Similar to IPV, rejecting and aggressive parenting was more frequent when substance use was involved, so that other risk factors such as hostility that increase the likelihood of substance use, also may increase the likelihood of poor parenting behavior.

It must be acknowledged that there is a directionality issue with all but one of our mediation findings because substance use may lead to poor parenting and IPV through hostility, except in the case of rejecting parenting. Our converse model examining mediation of the link from substance use to IPV by hostility was also significant suggesting the relationship may occur in the opposite direction. Indeed, a wealth of experimental research suggests that alcohol increases aggression and quasi-experimental studies support the role of substance use in increasing the incidence of IPV (Exum, 2006; Murphy & Ting, 2010). Use of alcohol in a laboratory study resulted in more hostile verbalizations (generated from hostile thinking) in response to relationship scenarios (Eckhardt, 2007). This study suggests that the use of substances may facilitate an increase in hostility leading to greater likelihood of aggression toward partners and children. Alternatively, there may be a bidirectional relationship between hostility and substance use and the link to IPV. Longitudinal research is necessary to resolve this directionality problem.

Substance use only served as a mediator between hostility and parental rejection and aggression when substances were used at higher levels, suggesting that frequent drug use may be necessary for an effect on

parenting to occur. This finding may provide some insight into why some fathers may perpetrate both IPV and child maltreatment, while others who are violent toward their partners, abstain from violence toward their children. Men with a combination of hostility and high levels of drug use seem to be the most at risk for hostile-aggressive and rejecting parenting. However, it must be acknowledged that not all men who use substances engage in IPV and/or negative parenting, and not all men who engage in IPV and/or poor parenting use substances.

Though these findings extend our knowledge of hostility and substance use in relation to IPV and parenting, they are limited in several ways. First, the study is cross-sectional in nature. Although it is typical to describe mediation models in a causal fashion, as we have noted above, causal interpretations of cross-sectional results must be made with caution. Future research could employ longitudinal methods to determine whether hostility, substance use, and IPV and parenting relate to each other in the manner described above. Additionally, this study relied on self-report measures only, which may have resulted in reporting bias. Studies that include multiple informants and direct observations of fathers and their children would strengthen these findings. Several studies have found that fathers report more of their antisocial behavior than mothers (Caspi et al., 2001), and fathers' reports of their parenting correlate more strongly than mothers' reports with reports and observations of children's emotional-behavioral status (Hernandez & Coley, 2007), evidencing the validity of fathers' reports of their own behavior. Furthermore, it must be acknowledged that these findings only apply to the fathers' behavior in a single father-mother-child triad and may not extend to the fathers' behavior with other romantic partners or offspring.

Another limitation concerns the study sample. The participants represented here generally included men with mild to moderate IPV behavior that do not represent the full severity of IPV and the small sample does not allow examination of the impact of specific kinds of drugs. Larger scale studies that include a broader range of IPV and drug use would aid in generalizability of these findings. Additionally, this study was designed to examine IPV and parenting among men in order to contribute to our understanding of fathering. However, we know that many women also engage in IPV (Black et al., 2011) and that mothers' parenting is clearly affected by hostility and substance use (e.g., Dunn et al., 2002; Rhoades et al., 2011). Future research could include women to identify gender differences, if any, in these phenomena.

Despite these limitations, this research has clear implications for prevention and intervention for both IPV and parenting. Current interventions for IPV focus

on educating men about their controlling patterns of behavior and/or reducing violence through anger management skills training. Unfortunately, programs focused on reducing controlling behavior and managing anger have been largely unsuccessful (Babcock, Green, & Robie, 2004; Feder & Wilson, 2005). What is unclear is whether these anger management programs actually reduce hostile thinking patterns. Development of novel treatments and research evaluation of new ways to target hostile thinking are warranted. Specific focus on the content of hostile thoughts in response to relationship-based situations, examination of the origins of these thoughts (e.g., learned from family of origin, unconscious response based on traumatic past, etc.), and practice of skills to reduce hostile thinking and impulsive responding may benefit men who are at high risk for use of substances and IPV in the context of hostility. Evaluation of such intervention would need to assess whether it resulted in less IPV and negative parenting. Some programs for batterers utilize cognitive behavioral strategies to target maladaptive thoughts and reactions (Gondolf, 2012). These methods have not been found to be any more effective than power and control models of IPV interventions (Babcock et al., 2004; Stover, Meadows, & Kaufman, 2006), but it may be that modifications or enhancements to these approaches would result in better outcomes, especially for those who use substances. Assessment of men for hostility and substance use may also facilitate identification of men for whom these issues are contributing to IPV, enabling implementation of programs that target the connection between hostility, substance use and violence.

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