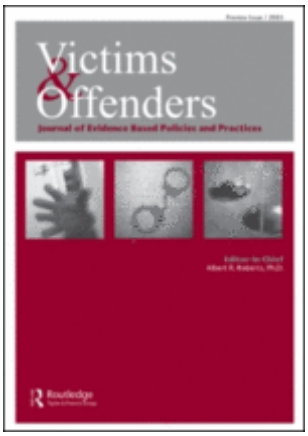

Measuring Implicit Theories of Intimate Partner Violence Using a Lexical Decision Task: An Exploratory Study

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Measuring Implicit Theories of Intimate Partner Violence Using a Lexical Decision Task: An Exploratory Study

Intimate partner violence (IPV) is a serious problem in the United States. The present study investigates whether a subset of unconscious cognitions known as implicit theories contribute to IPV. Thirty-three male and female university students completed a lexical decision task (LDT), which uses reaction times to gauge the degree of support for statements related to IPV. Findings indicated that IPV perpetrators held some implicit theories more strongly than non-perpetrators. Implications for treatment and research are discussed, as is the value of using tools like the LDT to measure otherwise elusive cognitive structures supporting deviant behavior.

Keywords: intimate partner violence, lexical decision task, offender cognition, implicit theories, reaction times

Introduction

Intimate partner violence (IPV) is defined as "physical violence, sexual violence, stalking, and psychological aggression (including coercive acts) by a current or former intimate partner" (Breiding et al., 2015). Approximately 7.9 million women and 7.3 million men experience IPV every year (Smith et al., 2017). Many have tried to reduce this number through prevention and intervention programs (see Ferraro (2018) for an overview of common intervention programs and their empirical standing), yet even the most successful programs have yet to make a dent in the overall prevalence of IPV across the country. Existing research has demonstrated that societal inequality exacerbates rates of IPV, while economic equality ameliorates them (Aizer, 2010; Levinson, 1989). On an individual level, IPV may be tied to deficits in social information processing (Holtzworth-Munroe, 2000) and emotional regulation (Berke et al., 2019). Perhaps most importantly, IPV often manifests on an interactional level as part of a perceived power struggle between partners (Anderson & Umberson, 2001; Mauricio & Gormley, 2001) or as a way of reasserting masculinity through the control of one's partner (Reidy et al., 2014), especially when men feel they have lost control in other contexts (Stets, 1995). Yet presently, we lack a clear understanding of the cognitive mechanisms contributing to IPV. To improve intervention programs, we need to better understand the etiology of IPV, especially the individual-level traits that trigger violence in the moment, such as offender cognition.

Due to IPV's general social unacceptability, rigorous approaches that measure IPV-relevant *implicit* cognitions—thought patterns people may not either know that they have or be willing to admit—are essential for capturing unconscious cognitive influences and avoiding biases stemming from socially desirable responses in self-report methods. The current study begins to address these needs through an exploratory analysis of whether a lexical decision task (LDT), a type of reaction time test, can measure the implicit theories of

IPV perpetrators.

Literature Review

As of 2012, the lifetime prevalence of IPV in the United States was 37.3% for women and 30.9% for men (Smith et al., 2017). Furthermore, about 14.1% of women and 18.2% of men report experiencing psychological aggression such as name-calling, insults, or threatening and controlling behavior by an intimate partner (Smith et al., 2017). Considering that IPV may be underreported, especially among women (R. P. Dobash & Dobash, 2004), these statistics likely underestimate the true prevalence of IPV.

The demographic breakdown of IPV perpetrators, however, is less clear. Many argue that violence against women, particularly in an intimate partnership, stems from men's need for power and control (Walker, 1989). In other words, IPV reflects an overarching societal problem rooted in gender-based discrimination. This common claim appears to be supported by existing data on sex differences in the frequency of IPV (Hamby, 2017). Women also have a much higher lifetime prevalence of experiencing sexual violence (16.4% vs. 7.0%) and severe physical IPV (e.g. punched, beaten, choked; 23.2% vs. 13.1%) compared to men (Smith et al., 2017). When more symmetrical results are reported, scholars argue that these are more likely artifacts of a misleading survey rather than meaningful parity (Hamby, 2016).

Conversely, others argue that women are as likely as men to perpetrate violence against their partners, with a majority of IPV being mutual (Renner et al., 2015; Robertson & Murachver, 2007; Testa et al., 2011). This pattern can be found in some of the most recent IPV data, where more men report experiencing physical violence in the past 12 months than women (4.7% vs. 3.9%) (Smith et al., 2017). Some studies suggest this symmetry occurs even within different types of violence (e.g. minor to severe), though the evidence is mixed (Robertson & Murachver, 2007).

One of the best efforts to make sense of these discrepancies is Johnson's (2008)

typology of IPV. Johnson argues that there are different *types* of IPV, and that discrepancies in the empirical patterning are artifacts of the sample and the focus of study. Scholars studying women in women's shelters would be more likely to meet women who were the victims of severe abuse—otherwise, they would not be in a women's shelter. National surveys, however, are more likely to capture less severe, more "common" couple violence and less like to capture severe IPV because neither party in that relationship is likely to voluntarily fill out and return such a survey. Thus, he posits that there are two primary kinds of IPV: *intimate terrorism* and *situational couple violence*. Intimate terrorism is a type of IPV characterized by the unilateral use of force by one partner—usually the male—towards another with the goal of completely controlling one's partner. Situational couple violence occurs when both parties engage in lower-level violence and abuse at comparable frequencies. Johnson's typology has some empirical support (Graham-Kevan & Archer, 2003), though it is unclear how well it reconciles discrepancies in the sex distribution of IPV (Bates & Graham-Kevan, 2016). Regardless of the exact sex distribution, studies of IPV offenders likely still benefit by including both men and women in their samples.

Causes of IPV

Likely because of the disagreement in the empirical patterning of IPV, there is no agreed upon theory of what causes intimate partner violence. At a societal level, some feminist theories argue that IPV stems from "the patriarchal domination of women" (R. E. Dobash & Dobash, 1979). As such, these theories generally explain "wife battering," a deliberately gendered description of IPV, as the result of societal male domination (Lawson, 2012). Stark (2007) furthers this line of explanation through his concept of "coercive control," which he argues is a specific type of oppressive, deliberate abuse designed to entrap and control their partners. Because men's ability to employ such tactics stems from their "gender-based privilege," his theory has abusive behavior originate at the societal level.

Similarly, Anderson (2005) argues that we cannot make sense of the empirical patterns of IPV without looking at the interactional and societal level, where gender differences in power and socially proscriptive behavior are more likely to manifest.

At the individual level, research has found that IPV offenders suffer from insecure attachment styles, which appear to cause jealousy, spousal distrust, and poor conflict resolution (Park, 2016). Another study found that violent men exhibited less empathetic accuracy toward their female partners than nonviolent men in healthy relationships (Clements et al., 2007). In other words, violent men were less capable of correctly inferring the thoughts and feelings of their female partner. Related studies have linked IPV to a more general deficit in social information processing; Holtzworth-Munroe (2000) summarizes a series of studies conducted by herself and colleagues demonstrating that violent married men have deficient social decoding skills. For instance, they tend to assume more hostile intent and feel more negative emotions in response to their wives' behavior as well as struggle to engage in productive conflict resolution.

Less is known about causes of female IPV perpetration. Some studies find that at least a subset of so-called perpetrators are responding in self-defense after being abused by their partner (Miller & Meloy, 2006; Richie, 1996). Such women are often the victims of intimate terrorism and therefore are responding with *violent resistance* (Johnson, 2008); as such, they will report technically engaging in IPV behaviors but with the unmeasured goal of self-defense. These women likely differ qualitatively from women engaged in situational couple violence, where both parties engage in violence and abuse at mostly equivalent frequency and usually with less severity than intimate terrorism. Research suggests that women engaging in this type of IPV may have similar individual-level social-psychological deficits causing their behavior as men, such as insecure attachment (Orcutt et al., 2005) or personality psychopathologies (e.g., borderline personality disorder; Goldenson et al., 2007). Women

also seem to desire control over their partner despite lacking the same structural power as men (Giordano et al., 2016; Hines & Douglas, 2010); thus, they may use IPV in the hopes of gaining control even if their efforts lack the same efficacy as men's.

Collectively, these studies indicate that, at the individual level, many male and some female IPV offenders struggle to adequately interpret social behavior, and this deficit is likely cognitive, but the specific mechanisms contributing to that deficit are still unclear.

Implicit Theories

One possible cognitive mechanism that influences IPV is people's implicit theories. Conceptualized by Ward and Keenan (1999), implicit theories are "core beliefs comprising coherent, interlocking ideas and concepts that people hold about themselves, others, and the social world" (Pornari et al., 2013, p. 497). Implicit theories begin developing in childhood and direct our expectations of the world (Polaschek & Gannon, 2004). Because implicit theories function at the unconscious level and involve other aspects of cognition such as memory (Gilchrist, 2009), they tap into the participants' latent cognitions. Implicit theories differ from more common cognitive distortions because they serve as the foundation for how people interpret their world and the behavior of others (Pornari et al., 2013). In other words, they may *cause* individual distortions, but implicit theories persist even when people are not making perceptual errors.

Offense-related implicit theories

Support for the existence of implicit theories has been found among various offender populations. Ward and Keenan (1999) first applied the paradigm of implicit theories to child molester cognition. There has since been some empirical support for specific implicit theories in child molesters (Mannix et al., 2013) and rapists (Polaschek & Gannon, 2004; Polaschek & Ward, 2002). Unfortunately, very little empirical research has investigated the existence of implicit theories in IPV perpetrators.

As a notable exception, Dempsey and Day (2011) interviewed eight IPV offenders. Using grounded theory, they found themes of implicit theories such as *Violence is Normal*, *Trust No One*, *I Am Always Right*, and *The Male is the Provider and Protector*. A similar study conducted by Weldon and Gilchrist (2012) analyzed interviews with male IPV perpetrators using interpretive phenomenological analysis. From these interviews, they extrapolated 11 sub-themes, such as *Violence is Acceptable, Need for Control, Real Man, Entitlement/Women are Objects, Women are Provoking, External Factors Responsible,* and *Nature of Harm*, all of which they classified as implicit theories. More recently, Shorey, Strauss, Zapor, & Stuart (2017) found that both male and female IPV offenders held early maladaptive schemas, which were similar in kind to the aforementioned implicit theories.

To help rectify the dearth of IPV implicit research, Pornari, Dixon, and Humphreys (2013) conducted a systematic review of the current empirical IPV research. Based on this review, they hypothesized the existence of seven different implicit theories: *Opposite Sex is Dangerous*, *General Entitlement*, *Relationship Entitlement*, *Normalization of Relationship Violence*, *Normalization of Violence*, *It's Not My Fault*, and *I am the Man*. Evidence supported the first six implicit theories for both men and women, with only the final one being gender-specific. Pornari et al. (2013) further hypothesized that there may be an implicit theory for *I am the Woman*, playing into the belief that women are not capable of really hurting men; however, the lack of studies on female IPV offenders hindered their ability to support this hypothesis. Although they inferred these implicit theories from evidence on perpetrator characteristics rather than using direct measures of implicit theories, they closely align with the implicit theories extrapolated from the aforementioned interviews with IPV perpetrators (Dempsey & Day, 2011; Weldon & Gilchrist, 2012).

Collectively, these implicit theories may help tie together several different theories of IPV perpetration. Both general entitlement, relationship entitlement, and gendered behavior

(e.g. *I am the man*) likely stem from societal-level messages about the privileged treatment men should expect to receive (feminist theory; R. P. Dobash & Dobash, 2004). Poor attachment to their parents, especially their mother, may also send the message that people of that sex are not to be trusted (attachment theory; Park, 2016). Then, when one finally makes the decision—consciously or unconsciously—to abuse their partner, they may assuage any guilt they may feel by placing the blame on their partner (techniques of neutralization; Sykes & Matza, 1957). Thus, different theoretical explanations may actually exert their influence on IPV perpetration through the development of criminogenic implicit theories.

Measuring implicit theories

One of the greatest obstacles to studying implicit theories is measuring them. A classic method it an Implicit Association Test (IAT; Greenwald et al., 1998), which has people classify words or images into composite categories, such as "adult or not sexy" vs. "child or sexy" (Nunes et al., 2007). Despite their popularity, it is unclear what exactly an IAT measures (Fazio & Olson, 2003). Even if an IAT can reliably measure the association between two categories, it is not clear which categories are being measured because words fall into multiple categories (Fazio & Olson, 2003). IAT measures have also come under scrutiny for their questionable validity in predicting behavior (Blanton et al., 2009). Finally, response times on an IAT may be manipulable (Steffens, 2004), which could negate much of the potential value of an IAT over traditional self-report.

A more promising method for measuring implicit theories is the LDT because the mechanisms underlying performance are better understood. In its basic form, the LDT flashes two letter strings on a screen and asks participants to indicate whether they are words or not words (Meyer & Schvaneveldt, 1971). Consistently, people respond faster when the words are semantically related (e.g. bread-butter) than when they are unrelated (e.g. bread-nurse) or nonwords (e.g. breaf-nirse). One variation uses sentence stems as primers (Fischler & Bloom,

1980). In the original study, participants were repeatedly presented with a sentence stem (e.g., "She cleaned the dirt from her") followed by a letter string (e.g., "shoes") and asked to identify whether the letter string was a word or not a word. Participants responded fastest when a word was both congruous (i.e. makes logical and grammatical sense in context) *and* highly expected (as opposed to a congruous but unexpected word; Schuberth & Eimas, 1977).

An LDT with a sentence prime can be exploited to measure implicit theories because sentence context automatically facilitates recognition of congruous, expected words. People with different implicit theories, therefore, may categorize different words as being highly contextual and expected when given the same sentence stem. In other words, a sentence stem will automatically prime some words more than others depending on the implicit theories the person already holds, and this differential priming effect can be measured through response times. Furthermore, it is very difficult to suppress the automatic priming effect of expected words; even when participants are instructed to do so, differences in reaction time persist (Fischler & Bloom, 1979). Therefore, when participants consistently respond faster to words following sentence primes that together express criminogenic statements, it is reasonable to conclude that participants implicitly hold those beliefs.

Scholars have used variations of the LDT to study expectations of harm in relationships in violent adolescent relationships (Lee et al., 2016) and alcohol-aggression scripts in adolescents (Brown et al., 2011); this specific sentence-prime variation has been used to study child molesters (Keown et al., 2008) and rapists (Blake & Gannon, 2010). Thus, while the LDT has strong theoretical backing and tentative empirical support, the method requires further development to assess its utility in detecting specific implicit theories.

The Current Study

Because implicit theories may be key intervening cognitive variables in several theories of IPV, this exploratory study investigated whether the LDT could detect the existence of four of Pornari et al. (2013)'s hypothesized implicit theories in IPV perpetrators. *Opposite Sex is Dangerous* referred to expectations of hostility from the opposite sex. *Relationship Entitlement* indicated expectations of dominance and control over their partner. *Normalization of Relationship Violence* meant that the participant viewed violence within the relationship as an appropriate means of conflict resolution. *It's Not My Fault* indicated someone who had a variety of excuses to justify or mitigate the severity of violence. A fifth implicit theory combined *I am the Man* with the hypothesized *I am the Woman* to create an implicit theory known as *Gender Norms*, which tapped into expectations of conventional/traditional gendered behavior.

The study was comprised of two parts. Adapting the methodology employed by Keown et al. (2008) to study implicit theories in child molesters, participants first completed an LDT designed to measure implicit theories related to IPV perpetration. Following the LDT, participants filled out a questionnaire comprised of demographic questions (e.g. age, sexuality) and the revised Conflict Tactics Scale (CTS2) to measure the levels of abuse in their relationship (Straus et al., 1996). Because of the exploratory nature of the study, there were two research questions:

1. Do participants who scored higher on the CTS2 as perpetrators of IPV respond faster to offense-congruent words than participants who scored lower?
2. Do male participants respond faster to offense-congruent words than female participants?

According to the theory behind the LDT, when people hold certain implicit theories, these beliefs should lead to faster responding to words congruent with offense-related

implicit theories. However, this particular version of the LDT is unestablished because there was no pre-existing LDT to measure these implicit theories. Therefore, it was important to assess whether variation in IPV perpetration related to differential responding in the expected direction. If the patterns were in the expected direction, it would provide support for both the LDT as a measure as well as the implicit theories found by Pornari (2013).

The second research question explores whether there were detectable differences in how men and women responded to offense-congruent items. If scholars like Anderson (2005) are correct about the role of gendered socialization in IPV, then male participants may be more likely than female participants to hold offense-congruent implicit theories regardless of IPV perpetration and thus respond faster to offense-congruent words

Methods

Participants

The University of Kent provided ethical approval before beginning the study. Students were recruited from a large pool of introductory psych students and compensated with course credit. A total of 22 female and 11 male undergraduate students (N = 33) participated in the study. Ages ranged from 18 to 36 (M = 21.76, SD = 3.40), with a majority of participants under the age of 25 (N = 31). All participants identified as heterosexual except for one who identified as bisexual. Approximately half identified as being in either a short- or long-term relationship (N = 18), with the other half being single (N=15). Of those who were single, only one participant had never been in a relationship.

Measures

The study used two primary measures: an LDT and the CTS2 (Straus et al., 1996).

LDT. Following the paradigm of Baldwin et al. (1993) and Keown et al. (2008), the LDT measures five implicit theories . The test consisted of nine sentence stems per implicit theory, for a total of 45 words, with three associated words per stem: one offense-congruent, one offense-incongruent, and one nonword (see Appendix A). Offense-congruent words refer

to words that, when preceded by a sentence stem, would indicate the presence of an implicit theory that facilitated IPV. For instance, for the sentence stem "In a relationship, hitting my partner is," the word "acceptable" would be an offense-congruent word because responding faster to it implies that the participant subconsciously views the word "acceptable" as an appropriate ending to the sentence. For the same stem, the word "abusive" would be an offense-incongruent word.

A one-way Analysis of Variance (ANOVA) on word type [$F(2,132) = .007$, $p = .993$] confirmed that there were no significant differences in word length between different types of words or in mean word length between different implicit theories [$F(4,40) = 1.037$, $p = .400$]. Finally, there were no interaction effects of mean word length between implicit theories and word type [$F(8,120) = .930$, $p = .974$]. Therefore, the words used were sufficiently comparable to not confound the results.

CTS2. The study relied on the IPV perpetration items of the CTS2 to measure the type and degree of negative conflict resolution strategies, often involving violence, within a partnership. The scale presents a series of statements such as "I insulted or swore at my partner" and asks the participant to mark the frequency with which each event occurred within the past year, ranging from "Never" to "More than 20 times" (Straus et al., 1996). The measure assesses physical, sexual, and psychological IPV at various severity levels. It has proven to be a reliable and valid measure, even across cultures (Archer, 2000; Straus, 2012).

Unfortunately, the CTS2 does not inherently account for context or severity of behavior (Krahé et al., 2005) and thus must be interpreted cautiously. However, its psychometric validity means it can still serve as a relatively accurate *tally* of abusive acts committed and experienced in a relationship by participants, especially among college students (Chapman & Gillespie, 2019).

Procedure

Participants came into the computer lab and completed the study in one of several small, private rooms with a single computer in each. The open-source application PsychoPy2 was used to present each of 45 sentence stems in random order for 3000 milliseconds (ms) followed by a letter string on screen for 2000 ms. To initiate the LDT, participants were asked to think of a memorable five-digit number to identify their data, thereby protecting their data and maintaining anonymity. When they entered their number, the program presented a series of written instructions followed by a five-item practice round to ensure they understood the task. They were told that the goal was speed and accuracy. If participants completed the practice successfully, they were prompted to press the space bar and move on to the main section of the LDT.

Upon completion of the LDT, the experimenter returned to the testing room and manually directed[1] them to a Qualtrics survey where they were asked to input their 5-digit number and then answer several demographic questions (e.g. age, sex) before presenting participants with the CTS2. When the survey was complete, participants received a written debrief and encouraged them to ask questions. The entire session took approximately 20 minutes.

Analytical Strategy

The analysis used Bayesian generalized linear models (BGLMs) with the package "rstanarm" (Goodrich et al., 2020) in R version 3.5.1 (R Core Team, 2018) as an alternative to commonly employed traditional (frequentist) generalized linear models. In general, Bayesian modeling involves estimating both the most probable value of a parameter (e.g., mean difference in reaction times) as well as uncertainty around that estimate in the form of a

[1] Due to technological limits in the lab, there was no way to automate this process.

"posterior" probability distribution of plausible estimates. This posterior distribution is generated by combining "prior" expectations about the plausible range of values for the parameter with the data-driven "likelihood" or observed distribution in the data. Traditional (frequentist) approaches, comparatively, rely solely on the likelihood of the data to generate parameter estimates. Another key difference between Bayesian and traditional approaches is that Bayesian models do not need to be corrected for multiple tests because they do not calculate *p*-values (which are sensitive to the number of analyses run on a given data set).

In this study, models were estimated with weakly informative normal priors. In simpler terms, this means that the model begins with some very weak assumptions about what parameter estimates to expect – such as that extreme positive/negative values are expected to be (somewhat) less likely than more moderate values. Such weakly informative priors are designed to allow the empirical data to dominate the analysis, similar to a traditional GLM, while simultaneously providing a mild constraint on implausible or impossible parameter estimates. Though some may worry that building in prior assumptions about parameter estimates would bias the results, assumptions are built into all statistical tests and, in this case, any biasing that occurs should typically make estimates more conservative. In other words, weakly informative priors primarily minimize false positives but otherwise "let the data speak" (Brauer et al., 2019; see also Cumming, 2014).

Results

A median split based on CTS2 scores separated the participants into two groups: high IPV perpetration ($N = 16$, $M = 20.50$, $SD = 20.42$) and low IPV perpetration ($N = 17$, $M = 1.88$, $SD = 1.96$). The groups were otherwise demographically comparable, with the high IPV group comprised of 64% women and 59% currently in a relationship and the low IPV group comprised of 67% women and 50% currently in a relationship.

Reaction times were analyzed for correct answers only, i.e., answers that correctly categorized whether the letter string was a word or a non-word (92.99%). On average, participants responded faster to offense-incongruent words (M = 820.18ms, SD = 189.69ms) than offense-congruent words (M = 862.27ms, SD = 174.48ms). As expected from the prior literature, people responded slowest to non-words (M = 886.98ms, SD = 184.86ms).

First, mean reaction times were calculated for each of the five implicit theories (see Table 1). Mean reaction times for offense-congruent words were then subtracted from the mean reaction times for their offense-incongruent counterparts to indicate the difference in reaction times: positive reaction times indicate faster responding to offense-congruent words, negative reaction times indicate faster responding to offense-incongruent words, and zero indicates no difference in reaction times. In order to account for individual variation in average responding times, mean reaction times to non-words served as a control variable for all analyses.

Presence of Implicit Theories

The model run for each implicit theory included both IPV perpetration and sex of participant. Each model calculates the median point estimate for each parameter along with the 50% and 90% credible intervals. These values are calculated directly from the posterior distribution—the model's probabilistic inferences about the true parameter values in the population—and are plotted in Figure 1. Unlike confidence intervals, the values closer to the middle of the range of estimates within a credible interval should be interpreted as *more probable* than those near the outside of the range, given the data and priors. Therefore, the further the distribution—indicated by the bolded and unbolded lines around the point estimates in Figure 1—is from the 0 midline, the less likely it is that the true value of the parameter is 0. The analysis also calculates the percentage of the posterior distribution falling

above 0. The larger the percentage, the more likely it is that the true parameter value is above 0 (indicating an effect in the expected direction).

Opposite sex is dangerous

Controlling for sex, high IPV perpetrators respond faster to offense-congruent words than low IPV perpetrators according to the model-generated posterior distribution, but both the 50% and 90% credible intervals—the bolded and unbolded lines in Figure 1— span zero, and the magnitude of the difference is very small (see Table 2 for all median point estimates and 50% and 90% confidence intervals). Furthermore, only about 55.30% of the probability mass—everything to the right of midline in Figure 1— falls above zero, which means that a little over half of the parameter estimates drawn from the posterior distribution indicate a faster response to offense-congruent words among high IPV perpetrators. Therefore, it is not very likely that high IPV perpetrators hold the implicit theory *Opposite Sex is Dangerous* more strongly than low IPV perpetrators, albeit with some uncertainty. The magnitude of the difference in response times between men and women is also low, with men responding slightly slower to offense-congruent words. About 60.93% of the probability mass—everything to the left of midline in Figure 1—falls *below* zero, making it slightly more likely that men respond slower to offense-congruent words than women. This indicates that women may be more likely than men to hold the implicit theory *Opposite Sex is Dangerous*, but there is substantial uncertainty in that estimate.

Relationship entitlement

Controlling for sex, high IPV perpetrators do not appear to respond much faster to offense-congruent words, though 62.35% of the probability mass—everything to the right of the midline in Figure 1—fell above 0. Net of perpetration, men respond faster to offense-congruent words related to *Relationship Entitlement* compared to women. The 50% credible interval does not span 0, as shown by the bolded line in Figure 1, but the 90% credible interval does. However, 78.13% of the probability mass falls above 0, which means it is

likely that men respond at least somewhat faster to offense-congruent words than women, though the magnitude of the difference is uncertain.

Normalization of relationship violence

As theoretically expected, high IPV perpetrators respond faster to offense-congruent words compared to low perpetrators according to the model; the 50% credible interval does not span 0, but the 90% credible interval does. However, 88.03% of the probability mass—everything above the midpoint line in Figure 1—is above 0, making it very likely that the high IPV perpetrators increased responding time to offense-congruent words. Men and women seem to have almost no difference in their response times based on a near-zero estimate for the median of the posterior distribution and only 51.53% of the probability mass above zero.

It's not my fault

As theoretically expected, high IPV perpetrators responded faster to offense-congruent words related to *It's Not My Fault* than low IPV perpetrators, with both 50% and 90% credible intervals—the bolded and unbolded lines in Figure 1—falling above 0. About 96.85% of the probability mass was above 0, making it very likely that high IPV perpetrators respond faster to offense-congruent words. Net of perpetration, men also responded faster to offense-congruent words compared to women, though the 90% credible interval spanned 0. Although the magnitude of the difference was smaller than for high IPV perpetrators, 85.38% of the probability mass was above 0. These results indicate that both male participants and participants who perpetrated IPV likely hold the implicit theory *It's Not My Fault*.

Gender norms

High IPV perpetrators responded faster to offense-congruent words compared to low IPV perpetrators, though the magnitude of the difference was relatively small and the credible intervals spanned 0. However, the probability mass above 0 was 69.95%, which indicates a possible difference between the two groups. The magnitude of the difference

between men and women was also small, with credible intervals spanning 0 and only 62.23% of the probability mass falling above 0. Both results can be seen in Figure 1, where the bolded lines (50% credible intervals) cross the 0 midline and the grey dot point estimates fall just above the midline. Thus, it is possible that high IPV perpetrators and men hold the implicit theory *Gender Norms,* but there is a lot of uncertainty.

Discussion

The present study assesses whether implicit theories related to IPV perpetration could be detected using an LDT. The findings indicate tentative support that the LDT works as hypothesized and can detect meaningful differences in implicit theories among high and low IPV offenders. The strongest evidence supports the presence of *It's Not My Fault* among high IPV offenders. The fact that high IPV offenders responded more quickly to offense-congruent words and that this estimate likely holds in the population provides evidence that high IPV offenders very likely hold the implicit theory *It's Not My Fault* to at least some degree. This finding concords with classic literature on how offenders use excuses and other forms of neutralization to deflect blame (Sykes & Matza, 1957). Three other implicit theories (*Relationship Entitlement, Normalization of Relationship Violence*, and *Gender Norms*) also generated most of the range of probable parameter estimates in the theoretically expected direction, indicating that high IPV offenders are more likely than not to hold these corresponding implicit theories. In other words, these results suggest it is likely that high IPV offenders hold up to four implicit theories related to IPV offending. As such, the results warrant replication in a larger sample to confirm the observed patterns and to generate more precise effect magnitude estimates.

Due to the small sub-samples of men and women and the exploratory nature of the study, it is difficult to draw conclusions about where gender differences occur and what the magnitude of the differences are. However, it is worth noting that this sample of men did

respond faster to words supportive of implicit theories *Relationship Entitlement* and *It's Not My Fault* even when they were not IPV perpetrators, a finding which coincides with prior research on men and feelings of entitlement in their relationships (e.g. Bouffard, 2010). The lack of gender differences elsewhere may reflect a simple lack of power necessary to detect an effect, or it may indicate support for the systematic review by Pornari et al. (2013) that found support for implicit theories in both sexes. Thus, the LDT may be useful in understanding gender differences in IPV perpetration, but further research using much larger samples will be needed to properly detect these differences.

Given the support for the presence of implicit theories, the study suggests a way to cohere disparate theoretical arguments under a single theoretical explanation. Unsurprisingly, it seems that a multitude of implicit theories may be at play concurrently when someone is engaging in IPV. For instance, *Relationship Entitlement* and *Gender Norms* may be individual-level manifestations of gender-specific societal lessons (e.g. Bouffard, 2010; West & Zimmerman, 1987) that make people, especially men, more prone to enacting violence. However, societal lessons are more pervasive than IPV perpetration, so individuals may also need the implicit theory *Normalization of Relationship Violence*, which is hypothesized to develop through the family unit and contribute to "intergenerational violence" (Besemer et al., 2017), to actually engage in violent behavior. They may also need a way to deflect blame for their actions, though it is unclear when in the process the implicit theory *It's Not My Fault* develops.

Limitations

The primary limitation is the study's small sample of university students. Small samples generate noisy and imprecise estimates, whereas relatively homogeneous student samples may exhibit truncated variation on key variables (e.g., fewer serious IPV perpetrators). Nonetheless, despite the small homogeneous student sample, this exploratory

study generated promising evidence of differences in implicit theory endorsement – as evidenced by differences in reaction times in an LDT – between participants with higher versus lower scores on an IPV scale. Though the small sample was suitable for exploratory purposes, future studies should follow with tests of the LDT instrument on larger, more representative samples with more geographically and behaviorally diverse participants. Subjecting results of this exploratory study to replication attempts in confirmatory studies using larger samples is important to assess the validity of conclusions drawn here. Successful replication of the findings of this study would bolster evidence for the hypothesis that implicit cognitions or theories as measured by the LDT indeed contribute to IPV behaviors.

In particular, confirmatory studies using a larger sample would allow for more accurate parameter estimates of the time differences in successful or lexically correct reactions to IPV offense-congruent versus offense-incongruent sentence stems. The wide credible intervals generated by these analyses, which are unsurprising given the small sample, make it difficult to conclude exactly how much faster perpetrators responded to offense-congruent words on the LDT. It is worth noting that differences were still detected even with a small sample. Yet despite the wide credible intervals, some of which include a zero-millisecond difference, there are multiple implicit theories for which a seemingly sizeable mean difference in reaction times was observed in the theoretically expected direction and, likewise, in which a majority of the most likely parameter estimates indicate faster response times to offense-congruent words among perpetrators. In addition to confirming the binary question of *whether* IPV perpetrators do or do not react more quickly to offense-congruent words, a larger sample would also make it easier to determine *how much* faster IPV offenders respond to offense-congruent words, thus improving the utility of the instrument.

A secondary limitation to this study was the lack of diversity within the sample. In particular, an analysis of sexuality would have added relevant nuance, but there was not enough variability within this measure. Although IPV may be pervasive across sexes, it is not gender-neutral behavior. Two of the implicit theories analyzed in this study – *Opposite Sex is Dangerous* and *Gender Norms* – indicated expectations of gendered behavior, and two other implicit theories – *Relationship Entitlement* and *Normalization of Relationship Violence* – may be influenced by pre-existing expectations of male-female interactions. Recent evidence suggests that people in same-sex relationships may be at higher risk for both injuring and being injured by an intimate partner (Graham et al., 2016). A study on lesbian couples indicates that expectations of gendered behavior (e.g. "girls don"t hit other girls") may contribute to this increased risk of IPV (Hassouneh & Glass, 2008), though it is unclear whether these behavioral expectations are qualitatively different from those held by heterosexuals. As such, future research should investigate the possibility of important interactions between IPV implicit theories and sexuality.

Future research should also consider variability across race and type of IPV. Scholars could explore the presence or absence of implicit theories in specific intersectional populations, such as whether Black and white IPV perpetrators hold the same implicit theories and the extent to which implicit endorsement of these cognitions vary within and across racial/ethnic and gender groups. Moreover, it is possible that the presence and strength of implicit theories differ for perpetrators of different types of IPV, such as differences in the degree to which certain implicit cognitions are held by IPV perpetrators who engage in forms of sexual coercion versus those who do not. Understanding these differences in implicit cognitions could then translate into how perpetrators might be rehabilitated, if possible.

Research Implications

The results of this study identify four implicit theories that appear to be involved with the perpetration of IPV. However, due to the exploratory nature of the study as well as the sample size, the generalizability of these results should be interpreted with caution. Because the sample was drawn from a college population, more extreme IPV perpetration might not have been captured adequately. Therefore, rather than being used as confirmation for the presence or absence of IPV-related implicit theories for all types of IPV perpetration, the study demonstrates the value of exploring implicit theories further as an explanation for IPV.

More importantly, the study demonstrates the utility of using an LDT as an implicit measure. As previously mentioned, there are no other measures that investigate the existence of IPV-related implicit theories. There were not enough participants to assess the validity of the measure, but there was some evidence that the instrument performed as expected. The development of an LDT specifically tailored to measure IPV implicit theories sets a more rigorous standard for the type of instrument that can be used to measure relevant cognitive mechanisms. Such a measure could supplement self-reports on cognitive products and small-sample qualitative analyses, and it may be useful for designing studies to assess implicit cognitive mechanisms that might help address existing evidence and debates about women's participation in IPV and IPV comparability across genders in at least for some forms of IPV.

Conclusion

Despite limitations, using an LDT to measure implicit theories holds promise for measuring implicit belief structures that are widely thought to exist yet otherwise are notoriously difficult to access. Because the LDT used in this study is newly developed, it needs to be thoroughly tested to ensure that it is a valid measure of IPV-related implicit theories. Most immediately, the study needs to be replicated with a greater number and variety of participants. If it holds up to scrutiny, an important next step would be to run the task on a population of IPV perpetrators of multiple sexes and sexualities as well as on a

community control sample. By investigating implicit IPV cognition using the LDT in a variety of relationship dynamics, it will be easier to tease out and possibly reform the cognitive mechanisms contributing to such a physically and emotionally damaging crime.

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Appendix A: Lexical Decision Task Words

Opposite Sex is Dangerous			
Stem	*Offense-Congruent*	*Offense-Incongruent*	*Non-Word*
1. On the whole, people of the opposite sex are	Liars	Kind	Breaf
2. When my partner criticizes me, they are usually	Wrong	Fair	Fland
3. When we fight, my partner is usually	Guilty	Honest	Kinter
4. When interacting with the opposite sex, it is best to be	Cautious	Friendly	Likrary
5. The opposite sex primarily cause	Pain	Pleasure	Nossip
6. I find the opposite sex to be extremely	Selfish	Exciting	Dolghin
7. Getting into a relationship with the opposite sex is	Dangerous	Fulfilling	Trojection
8. People who trust the opposite sex are	Foolish	Sensible	Jolidify
9. Relating to the opposite sex is	Impossible	Rewarding	Absowbent

Relationship Entitlement			
Stem	*Offense-Congruent*	*Offense-Incongruent*	*Non-word*
10. In a relationship, I see my partner as my	Inferior	Competent	Blassroom
11. When I hurt my partner, I feel	Justified	Guilty	Kreezer
12. When I see my partner succeed, I feel	Angry	Happy	Yofit
13. When in a relationship, my partner must always be	Obedient	Caring	Valcano
14. My partner's opinion is always	Useless	Valuable	Gandage

15. If I punish my partner for disobedience, I am being	Assertive	Controlling	Roindabout
16. In a relationship, I am almost always	Right	Open	Veech
17. If my partner challenges me, they are	Disrespectful	Assertive	Inweritance
18. The most important aspect of a relationship is	Control	Trust	Phapel

Normalization of Relationship Violence

Stem	*Offense-Congruent*	*Offense-Incongruent*	*Non-word*
19. In a relationship, hitting my partner is	Acceptable	Abusive	Aoncierge
20. When I use physical force against my partner, I feel	Justified	Guilty	Norinal
21. Slapping my partner will lead to more	Respect	Conflict	Grologue
22. I would see my parents hitting each other as	Ordinary	Bizarre	Senafor
23. I often find resolving conflicts with my partner to be	Volatile	Rewarding	Cimetary
24. Physically resolving a conflict is generally	Necessary	Damaging	Hearkbeat
25. A partner who resolves a conflict with physical force is	Powerful	Violent	Netwurk
26. If my friends knew I hit my partner, they would be	Supportive	Horrified	Phokograph
27. Using physical force to control my partner should be	Legal	Criminal	Handeag

It's Not My Fault

Stem	*Offense-Congruent*	*Offense-Incongruent*	*Non-word*
28. If I only get angry when I'm drunk, I should be	Excused	Blamed	Lintil

29. Taking my stress out on my partner sometimes makes me feel	Satisfied	Guilt-ridden	Calculatoc
30. People who lose their temper are usually	Provoked	Volatile	Spratter
31. Hitting a partner who has angered me is	Inevitable	Unacceptable	Transformey
32. When things go wrong in my life, it is usually the fault of	Others	Myself	Valsey
33. People who hurt their partner when they lose their temper should be	Forgiven	Blamed	Leesure
34. A partner who provokes me is just asking for	Trouble	Attention	Entelope
35. A drunken person who hurts their partner is	Guiltless	Responsible	Matchspick
36. If a partner does something wrong, hitting them can't be	Helped	Right	Neefle

Gender Norms

Word Stem	*Offense-Congruent*	*Offense-Incongruent*	*Non-word*
37. Compared to women, men are inherently more	Superior	Stubborn	Sarticle
38. Women who speak their minds should be	Silenced	Respected	Humidicy
39. Having a man as the head of household is	Typical	Archaic	Fliprer
40. Men who show their emotions are	Pathetic	Mature	Insline
41. Women are primarily defined by their	Emotions	Strength	Materval
42. One primary role of men is to	Command	Nurture	Daztime
43. It is natural for men to be	Dominant	Sensitive	Workplece
44. It is natural for women to be	Weak	Strong	Ciler
45. Women should always know their	Place	Worth	Rebed

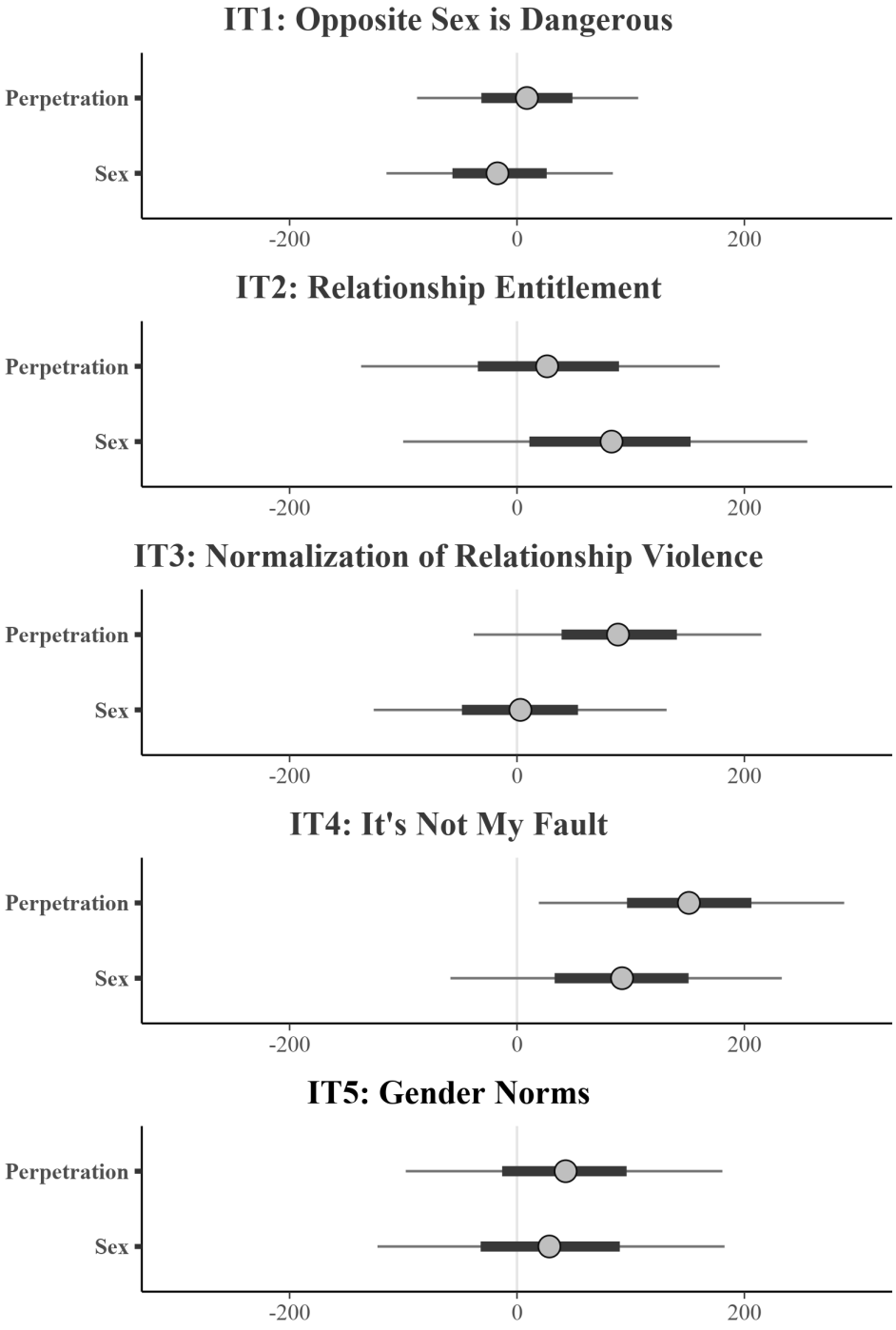
	Mean	Std. Deviation
Offense-Congruent		
Opposite Sex is Dangerous	871.70	220.94
Relationship Entitlement	914.61	258.85
Normalization of Relationship Violence	871.11	221.85
It's Not My Fault	826.65	178.90
Gender Norms	798.74	185.48
Offense-Incongruent		
Opposite Sex is Dangerous	779.17	214.21
Relationship Entitlement	789.67	246.01
Normalization of Relationship Violence	808.71	182.37
It's Not My Fault	832.32	215.81
Gender Norms	884.16	283.66

Table 1. Mean reaction times (in milliseconds) to LDT words

	Median	50% CI	90% CI
Opposite Sex is Dangerous			
Perpetrator	8.73	[-31.38, 48.79]	[-87.91, 106.61]
Sex	-17.20	[-56.78, 26.14]	[-114.82, 84.32]
Relationship Entitlement			
Perpetrator	26.46	[-34.45, 89.69]	[-137.12, 178.30]
Sex	83.17	[10.89, 152.68]	[-100.16, 255.32]
Normalization of Relationship Violence			
Perpetrator	88.83	[39.20, 140.63]	[-38.10, 214.89]
Sex	3.00	[-48.45, 53.66]	[-126.04, 131.57]
It's Not My Fault			
Perpetrator	151.22	[96.75, 206.16]	[19.20, 287.78]
Sex	92.40	[33.10, 150.93]	[-58.56, 232.88]
Gender Norms			
Perpetrator	42.78	[-13.06, 96.42]	[-97.84, 180.65]
Sex	28.49	[-31.97, 90.42]	[-122.73, 182.57]

Note: Sex is coded as 1=Female, 2=Male and Perpetrator is coded as 1=Low and 2=High

Table 2. Median Parameter Estimates and 50% and 90% Confidence Intervals



Note: for Sex, 0 = female

Figure 1. Parameter estimates for all 5 implicit theories. The grey dot indicates the median "point estimate" of the posterior—the model's best estimate for the true value of the parameter. The 50% credible intervals are indicated by the bold, horizontal lines the 90% credible interval are indicated by the unbolded lines. The light gray vertical midline indicates zero difference in response times between offense-congruent and offense incongruent words. The further the mass of the distribution is from 0, the less likely that difference in response time is 0.