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Meta-Analysis of Cyber Intimate Partner Violence's Perpetration and Victimization: Type  
Differences and Their Associations with Face-To-Face IPV Among Men and Women

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## Meta-Analysis of Cyber Intimate Partner Violence's Perpetration and Victimization: Type Differences and Their Associations with Face-To-Face IPV Among Men and Women

### **Abstract**

Cyber intimate partner violence (C-IPV) is a technology-mediated form of violence. It has been examined only in the last ten years as a form of violence that can cause psychological damage to its victims. How this phenomenon connects to and differs from face-to-face IPV (F2F-IPV) has been, as yet, little studied. Research has not made clear whether sex differences may impact its use, particularly in light of the fact that no physical coercion is used in C-IPV. Thus, the current research aimed to investigate through a meta-analysis: differences between the average levels of different types of C-IPV victimization and perpetration; the association between C-IPV and F2F-IPV victimization and perpetration; and, whether the answers to these questions were dependent on sex. The current meta-analysis drew on 46 studies, within 44 papers, with a total sample of 27,491 participants. Findings from 22 of these studies showed no significant sex differences between the average levels of different types of C-IPV victimization and between different types of C-IPV perpetration. These 22 studies showed positive large effect sizes for the correlation between C-IPV and F2F-IPV perpetration and victimization. Moreover, in both perpetration and victimization, sex did not impact the level of association. The findings suggested that C-IPV and F2F-IPV are highly correlated, and though not the same, they may share similar characteristics. Additionally, the results suggested that sex differences do not impact non-physical aggression, such as C-IPV. The implications for preventive strategies include that IPV interventions should also focus on alleviating instances of C-IPV.

*Keywords:* electronic aggression, digital dating abuse, cyber dating abuse, intimate partner violence, meta-analysis, cyber aggression, gender

## Meta-Analysis of Cyber Intimate Partner Violence's Perpetration and Victimization: Type Differences and Their Associations with Face-To-Face IPV Among Men and Women

Cyber intimate partner violence (C-IPV or cyber IPV) is a technology-mediated form of violence. It has been investigated only in the last ten years as an expression of violence and has been given different constructs and definitions (Rocha-Silva et al., 2021). Most frequently, it has been defined as a form of intimate partner violence (IPV) that occurs between two individuals who are currently, or have been, intimately involved with each other (Cano-Gonzalez et al., 2021; Watkins et al., 2018). Cyber IPV includes monitoring a partner's online activities, exerting control over their online communications, making hostile threats, and/or sharing embarrassing photos via electronic tools. These and other behaviors have also been labeled as digital dating abuse, electronic aggression, or cyber dating abuse. Relatively recent typologies outline C-IPV as including psychological aggression (Leisring & Giumetti, 2014), sexual aggression (Zweig et al., 2013), and cyber stalking behavior (Schnurr et al., 2013). Since the C-IPV phenomenon began to be examined, the literature has questioned its nature: Is C-IPV indirect aggression or another way of controlling/abusing, that is, traditional aggression in intimate relationships (for example, psychological, physical) (Schoffstall & Cohen, 2011)? To answer this question, the field must still focus upon the basic questions regarding this phenomenon: 1) How is this phenomenon distributed, specifically among different ages; 2) What are the sex delineations of its perpetrators and persons injured; and, 3) Is this phenomenon associated with F2F-IPV. Therefore, the current study, by using meta-analysis methods, offers an in-depth examination of the possibility of sex differences in different types of C-IPV, whether there are C-IPV associations to face-to-face IPV (F2F-IPV), and an exploration of sex differences in the association between C-IPV and F2F-IPV among adults.

Regarding the phenomenon's distribution, the extant literature on C-IPV suggests very inconsistent rates of both victimization and perpetration. To illustrate, based on a research synthesis, victimization rates were found to range from 2% to 38% and perpetration rates from 5% to 46% among adolescents examined in different studies (Stonard et al., 2014). Additionally, a systematic review of dating abuse showed that the reported rate of cyber dating victimization through online control ranged from 65% to 81% in the reviewed studies (Caridade et al., 2019). Rates not limited to a specific age among youth (ages ranged between 10 and 26 years old) have been found to vary from 8.1% to 93.7% for perpetration and 5.8% to 92% for victimization (see systematic review, Caridade et al., 2019). In addition, victimization among female adolescents and women were found to range from 1% to 78% (Fernet et al., 2019). Further, aside from the issue of inconsistent rates, as most studies have examined this kind of aggression during adolescence and young adulthood, many questions regarding this phenomenon specifically among adults remain open. Therefore, the current study focuses its in-depth examination of the multidimensional nature of C-IPV (the types) only within this adult population.

When cyber IPV is broken down into categories, inconsistent results persist. The first such category, *psychological aggression* (Leisring & Giumetti, 2014) includes both use of information (e.g., pictures, video, word messages) from technology and posting or sending information through technology to cause emotional harm to one's partner (e.g., spreading rumors about their partner on social media or repeatedly insulting their partner over text). The perpetration rate of psychological aggression was found to range from 34% to 64% and the victimization rate varied from 29% to 94.8% in the reviewed studies (for a systematic review on dating abuse see Caridade et al., 2019). The second category, *sexual aggression* (Zweig et al., 2013), includes requesting or pressuring partners to send sexual content against their wishes, pressuring partners to engage in sexual acts, and sending unwanted sexual content to

partners. The rate of victimization for sexual aggression ranged from 13% to 92.6% (Caridade et al., 2019). The third type, *cyber stalking behavior* (Schnurr et al., 2013), includes accessing electronic devices and accounts without a partner's permission and monitoring partners through electronic devices (Watkins et al., 2018). A systematic review of dating abuse showed that the rate of cyber dating victimization through online control ranged from 65% to 81% (Caridade et al., 2019). Despite the broad range of findings and the differentiation of cyber IPV into categories, there has yet to be a meta-analysis of C-IPV among adults that takes into account data on the specific types of C-IPV.

In addition to investigating the nature of C-IPV, both in terms of perpetration and victimization, scholarship has discussed whether the nature of the aggression of C-IPV is different from that of F2F-IPV. Those who have claimed that C-IPV is not part of F2F-IPV's acts of physical aggression have suggested that C-IPV is indirect aggression, meaning, one not connected directly to F2F-IPV victimization (Borrajo et al., 2015). Other studies have claimed that this abuse is part of face-to-face abuse as it is used before or after the occurrence of face-to-face abuse. Thus, search questions about the nature of the C-IPV phenomenon and its differences from F2F-IPV can be framed through the possible distinctions across men and women. Empirical data in F2F-IPV literature point out that the rates of men and women using violence are almost similar (Stith et al., 2012; Straus, 2011; Straus & Michel-Smith, 2014). The main difference is that men's violence is more severe and causes more physical and emotional harm (Hamby, 2016; Johnson, 2008). This is claimed to be due to the physical differences between men and women. Thus, the sex distribution in C-IPV use may differ from that which typifies face-to-face IPV because, on social media, the physical strength to perpetrate violence and aggression is not of consequence. However, it is also possible that these digital behaviors are associated with later in-person victimization experiences (e.g., the pressure to send sexual photos over social media may be followed by the pressure to perform

sexual acts in person), and that this aspect makes C-IPV victimization experiences more impactful (Henry & Powell, 2018).

Furthermore, while meta-analytic exploration revealed that females were slightly less likely to cyber-bully than males (Barlett & Coyne, 2014), some evidence suggested that women perpetrate greater levels of psychological aggression in general (e.g., Archer, 2000), also when comparing sex differences in relation to different types of F2F-IPV (Hines & Saudino, 2003). Although men perpetrate sexual violence more (e.g., Hines & Saudino, 2003), examination of how sexual violence may be expressed in C-IPV is important. Thus, if C-IPV is considered a form of traditional F2F-IPV aggression, males would be more likely to perpetrate stalking (that is, it can be considered as a type of physical control) and sexual cyber IPV than females. On the contrary, if it is considered relational/indirect aggression, females would be slightly more likely to perpetrate cyber IPV than males as has been found in relation to psychological aggression (Archer, 2000). Thus, there is a need to examine how C-IPV and F2F-IPV inter-relate and to examine the differences between men and women in using and experiencing cyber IPV.

In order to examine the possible sex differences between C-IPV and F2F (both victimization and perpetration) there is a need to examine also sex differences in relation to the different types of C-IPV. Yet, the several studies that have examined sex differences within the different types of C-IPV perpetration and victimization have suggested only mixed findings. Whereas among teens, males have been found to be more likely to engage in online threatening behaviors, especially those involving sexual coercion (Henry & Powell, 2018), females have been found to use monitoring behaviors more frequently (Lucero et al., 2014). Some researchers pointed out that women had higher rates of "intimate terrorism" than men over cyberspaces (Daskaluk, 2016); for example, females were significantly more likely than males to monitor the email accounts of their partners (25% vs. 6%) (Burke et al., 2011).

An overall association between C-IPV and F2F-IPV would possibly elucidate the nature of the C-IPV phenomenon and its distinctions from F2F-IPV. To date, only a few review or meta-analysis studies exist. Generally, in a meta-analysis, intercorrelation was found between traditional F2F-IPV victimization and cyber-victimization ( $r = .43$ ) (Gini et al., 2018). Indeed, studies have also found C-IPV to be associated with other manifestations of abuse among couples. For example, in one study a high correlation was found between C-IPV and F2F-IPV perpetration (Watkins et al., 2018). In addition, a longitudinal model found that being a victim of F2F-IPV predicted being a victim of C-IPV (Temple et al., 2016) and a regression model found that psychological aggression in F2F-IPV showed a statistically significant relationship with cyber dating abuse victimization (Borrajo et al., 2015). In relation to the possible role of sex in the relationships, one study found less physical F2F-IPV and C-IPV among men than among women (Schnurr et al., 2013). Other studies have found that this association is stronger (Watkins et al., 2021) or similar (Flach & Deslandes, 2017) among men. As such, it is important to further explore the complexity of this phenomenon by using the meta-analysis approach to compare the levels of C-IPV (i.e., a multidimensional model of C-IPV) and F2F-IPV, and moreover, to examine the associations between these two forms of IPV, and how sex informs these associations.

### **The Current study**

The unanswered questions this study sought to address are the extent of the C-IPV phenomenon among adults in the accumulated C-IPV literature, its relation to F2F-IPV, and how its characteristics differ between men and women. In particular, the current meta-analysis aimed to clarify the possible sex differences of this phenomenon and the possible sex-related associations between face-to-face IPV and cyber IPV. In doing so, we integrated the existing empirical literature and its testing methods and built upon its diversity: its different types of populations, ages, and geographical locations. The two research questions examined were: (1)



Are there sex differences between average levels of different types of C-IPV, related to either victimization or perpetration in adults; (2) How do cyber IPV and face-to-face IPV perpetration and victimization relate to one another and what is the association between C-IPV and F2F-IPV perpetration and victimization in overall terms and when separated by cyber aggression type and sex.

## **Method**

### **Search Strategy**

Searches were conducted and completed by a health sciences librarian on October 4, 2019, and articles were identified through computerized searches of seven central databases of social work and psychology: EBSCO PsycINFO, Criminal Justice Abstracts, ERIC, MEDLINE, Social Sciences Full Text (H.W. Wilson), APA PsycArticles and Web of Science. We considered searching PubMed and Google scholar; however, after running the search in both databases, we realized that neither added unique articles. The PIs have expertise with studying IPV, and C-IPV. Together with the co-authors, the PIs discussed and identified all formal terms that denoted and related to "IPV" "cyber space" and "communication through cyberspace." Based on the decision to use the most expanded search terms in this study, the S1 and S3 terms attempted to encompass any type of expression that would represent IPV. In adding S2 terms, we restricted the study to IPV occurring in the cyber domain. Our search terms were highly inclusive to maximize the chances of locating relevant papers and included any type of C-IPV. A multitude of search terms used the following structure: (S1) intimate partner or dating or romantic or "affective relationship\*" or domestic; (S2) cyber\* or digital or electronic or technology\* or online or social media or internet or apps or mobile device; (S3) aggression or violence or bullying or harassment or abuse or monitor\* or control\* or coerci\* or stalking or sexting or unwanted pursuit behaviors or victimization or perpetration. Results were limited to papers published between 2000 and 2019 (Figure 1) and

distributed by database: 5,490 from Ebsco PsycINFO, Criminal Justice Abstracts, ERIC, MEDLINE, Social Sciences Full Text (H.W. Wilson), 96 from APA PsycArticles, and 5,168 from Web of Science. Total: 10,754, Duplicates: 2,036, Grand total after duplicates: 8,718; search conducted in April 2019.

This search resulted in a pool of 8,718 papers after removing duplicates. The scanning of this pool of papers was conducted in two steps. The first step involved examining abstracts to identify relevant articles. This step was conducted by the first five authors, comprised of two graduate-level (JC, VC) and two PhD-level researchers (OG, RC), and one senior undergraduate researcher (OT) with research experience in the field of C-IPV. The research team consisted of social workers and psychologists. We found that 8,394 papers either did not include the relevant variables for C-IPV or fit the exclusion criteria (i.e., thesis/dissertation, not in English or Spanish languages<sup>1</sup>) and these articles were excluded. In the second step, the remaining 324 papers were examined closely by reviewing the whole paper according to the detailed inclusion criteria. At this stage, 234 papers were excluded, due to the following reasons: the papers did not address C-IPV or the papers were duplicate records and hence were excluded. This process ended with 44 papers being included in the review. All stages of the identification, screening and eligibility were performed by the first five authors. Ten percent of the screening and 20% of the data coding were reviewed and coded by two different coders as part of the reliability process. Inconsistencies were noted in approximately 10% of the articles during the screening and data coding process, and these were discussed until consensus was reached. A detailed account of the stages of the literature screening appears in the PRISMA diagram in Figure. 1.

## **Study Inclusion and Exclusion Criteria**

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<sup>1</sup> English and Spanish papers were considered as members the research team had fluency in those languages.

Studies were included if they met the following inclusion criteria: (1) examined any type of C-IPV; (2) assessed participants ages 18 years or older or with a mean age of 18 years or older. This was included because this study's focus is on IPV in adult relationships; (3) provided sufficient information to allow for an effect size calculation (i.e., means, standard deviations, zero-order correlations); (4) were peer-reviewed studies; and, (5) were available in English or Spanish. Five coders (two PIs and another three coders) assessed all studies for inclusion. Studies were excluded if they met the following exclusion criteria: 1) thesis/dissertation; 2) exclusive use of qualitative designs; or, 3) school population.

### **Data Extraction**

The following data were coded from each study: (1) description of the sample; (2) geographical location of study; (3) sample size; (4) binary gender of participants (male vs. female); (5) age (average or range) of participants (in years); (6) descriptive statistics of C-IPV and F2F-IPV (mean, SD, frequencies); (7) descriptive statistics of types of C-IPV, namely, psychological, stalking, sexual, or other, and of F2F-IPV, namely, psychological or physical; (8) all quantitative statistical indicators of the relation between C-IPV and F2F-IPV (split by sex and IPV type). Data drawn for each included study appear in Table 1.

### **Methodological Quality Appraisal**

Each study underwent a methods appraisal to ensure quality and validity of included findings by using an 11-point assessment scale. This included a 9-point assessment scale created by a prior meta-analytic study in the field used to evaluate the studies on sexting behavior in adolescents (Mori et al., 2019). We added two additional assessment criteria, namely, measurement of reliability and provision of information on missing data (please see the Appendix). Each criterion was given a score of 0 (information absent) or 1 (information present) and scores were summed for a total quality score out of a possible 11, with higher scores indicating better study quality (Table 6). Consistent with previous research, scores of 1

to 3 were considered low quality, 4 to 6 were of moderate quality, and 7 to 11 were high-quality studies. One low-quality study was eliminated from the analysis.

### **Data Analysis**

Analyses were conducted using the Stata software version 15 (StataCorp., 2017). In Section I, effect sizes represent sex differences between mean levels of C-IPV types. Effect sizes were coded so that a positive difference indicated that C-IPV/F2F-IPV types were higher in males than in females. In Section II, effect sizes reflected the strength of the correlation between types of C-IPV and F2F-IPV. Effect sizes were coded so that a positive effect size indicated a positive correlation between levels of C-IPV and F2F-IPV. In this section, the analyses contained two parts: in the first, the correlations between C-IPV types and F2F-IPV types were examined; in the second section, subgroups analyses were presented focusing on the correlations between C-IPV types and F2F-IPV types split by sex.

### **Results**

We will first address C-IPV, looking into cyber perpetration types followed by cyber victimization types. We will examine the sex differences in types of cyber perpetration and types of cyber victimization. Second, we will examine the correlation between C-IPV types and F2F-IPV types.

#### **Section I – Cyber Perpetration and Cyber Victimization: Means/SDs Across Sex**

In this section, we address the sex differences in levels of cyber perpetration and cyber victimization.

##### ***Section Ia. Sex Differences in Cyber Perpetration***

A total of 8,940 participants were assessed in the 16 studies included in this section of our meta-analysis. Of these, 3,309 were men and 5,631 women and the average number of participants in each study was 558.75 (*range*: 79 to 1,167). The mean age of participants was 25.53 (*SD* = 5.00, *range*: 18 to 70) across the 16 studies. Most studies were conducted on

U.S.-based samples (43.75%), with study samples also from Italy, Spain, Mexico, Israel, and Ghana. All studies were cross-sectional in nature and the earliest study was published in 2011.

As shown in Table 2, the pooled effect size for the difference between male and female participants on levels of cyber perpetration across 40 effect sizes in 16 separate studies was non-significant (*Cohen's d* = 0.01, 95% CI [-0.17, 0.19]). Homogeneity analyses indicated that the set of effect sizes was primarily homogenous:  $\tau^2 < .001$ .

### ***Section Ib. Sex Differences in Cyber Victimization***

A total of 10,714 participants were assessed in the 23 studies included in this section of our meta-analysis. Of these 4,107 were men and 6,607 were women, with the mean number of participants in each study being 46.582 (*range*: 35 to 1,136). The mean age of participants was 25.06 (*SD* = 5.00, *range*: 18 to 70) in each study. Nearly half of the studies were conducted on samples based in the U.S. (47.62%), with study samples also from Italy, Spain, Peru, Belgium, Mexico, Israel, and Ghana. All studies were cross-sectional in nature and the earliest study was published in 2011.

As depicted in Table 2, the pooled effect size for the difference between male and female participants on levels of cyber victimization, across 80 effect sizes in 22 separate studies, was non-significant (*Cohen's d* = -0.18, 95% CI [-0.58, 0.30]). Homogeneity analyses indicated that the set of effect sizes was primarily homogenous:  $\tau^2 < .001$ .

## **Section II – Correlations Between C-IPV and F2F-IPV Types**

In this section, we addressed the correlations between types of cyber perpetration and face-to-face perpetration and sex differences in levels of correlation by type of IPV.

### ***Section IIa. Correlations Between Cyber Perpetration and Face-to-Face Perpetration***

A total of 7,557 participants were assessed in the 16 studies included in our meta-analysis, with 2,784 men and 4,773 women, with an average number of 503.80 participants in each study (*range*: 79 to 1,167). The mean age of participants was 25.66 (*SD* = 5.70) in each

study. Many of the studies were conducted in the U.S. (46.67%), with studies conducted also in Australia, Italy, Spain, and Israel. All studies were cross-sectional in nature.

As shown in Table 3, the pooled effect size for the associations between perpetration of cyber IPV and perpetration of face-to-face IPV, across 148 effect sizes, was *Fisher's z* = 0.43 (95% CI [0.34, 0.52]), indicating that individuals who reported perpetrating C-IPV also reported perpetrating F-IPV. This correlation was significant for male (*Fisher's z* = 0.43, 95% CI [0.31, 0.54]) and for female participants (*Fisher's z* = 0.37, 95% CI [0.23, 0.52]). Homogeneity analyses indicated that the set of effect sizes was primarily homogenous:  $\tau^2 = .03$ .

Given the relative lack of heterogeneity and smaller number of studies for moderation analyses, we conducted two moderation analyses for variables that were of a priori interest: sex and age. These variables were entered separately to bivariate meta-regression analyses. As can be seen in Table 3, the two moderators were not statistically significant ( $p < .05$ ). However, due to its empirical importance, we conducted analyses split by sex.

**IPV Perpetration and Sex.** Table 3 outlines effect sizes by sex and by types, indicating that all effect sizes were significant. This suggests that there is a significant positive correlation between perpetration of C-IPV and F2F-IPV in all types examined and when examined separately for male and female participants. It should be noted that due to the fact that studies of sexual IPV were relatively few, the results might not be highly reliable.

### ***Section IIIb. Association Between Cyber Victimization and Face-to-Face Victimization***

A total of 13,236 participants were assessed in the 16 studies included in our meta-analysis, with 2,269 men and 10,947 women, and with an average number of 882.40 participants in each study (*range*: 79 to 6,818). The mean age of participants was 22.79 ( $SD = 4.15$ ) in each study. Most studies were conducted in the U.S. (71.43%), with studies also originating from Spain, Peru, and Israel. All studies were cross-sectional in nature.

As can be seen in Table 3, the pooled effect size for the association between victimization of cyber IPV and victimization of face-to-face IPV, across 148 effect sizes, was *Fisher's z* = 0.45 (95% CI [0.33, 0.57]), indicating that individuals who report victimization from cyber IPV also report victimization from face-to-face IPV. These positive correlations were significant for male (*Fisher's z* = 0.53, 95% CI [0.31, 0.74]) and for female participants (*Fisher's z* = 0.40, 95% CI [0.28, 0.52]). Homogeneity analyses indicated that the set of effect sizes was primarily homogenous:  $\tau^2 = .08$ .

Given the relative lack of heterogeneity, we conducted two moderation analyses for variables that were of interest a priori: sex and age. These variables were entered separately to bivariate meta-regression analyses. As can be seen in Table 4, the two moderators were not statistically significant. However, due to its empirical importance, we conducted analyses split by sex.

***IPV victimization and sex.*** As can be seen in Table 3, all effect sizes were significant, indicating that there is a significant positive correlation between victimization by cyber IPV and face-to-face IPV in all types examined and when examined separately for male and female participants. It should be noted that due to the fact that studies of sexual IPV were relatively few, results might not be highly reliable.

### **Publication Bias Analysis**

The traditional tools (e.g., funnel plots, Egger's regression, etc.) of publication analysis do not account for nested data, which is the data in the present study. Thus, we conducted a Robust Variance Estimation (RVE) meta-regression of the standard error against the effect size to explore the possibility of small study bias, or the potential for the meta-analysis results to be biased due to the omission of studies with small sample sizes and null/negative findings. This was conducted for the second section of our study. The regression models for perpetration and for victimization were not significant (see Table 5). Thus, these results

suggest the potential for small study bias in the effect sizes is minimal.

### **Discussion**

The overarching aim of the current research was to investigate whether C-IPV is a separate phenomenon or strongly related to traditional F2F-IPV. To do so, we used a meta-analytic approach by investigating sex differences in the use of C-IPV, and C-IPV's associations to F2F-IPV. Overall, the study finds no significant sex differences between the average levels of different types of C-IPV victimization and between different types of C-IPV perpetration. Findings also show large effect sizes for the correlations between C-IPV and F2F-IPV perpetration and victimization, but sex did not impact the level of association.

#### **Sex Differences in Types of C-IPV**

In the first section of our study, we compare rates of C-IPV of males and females. Our meta-analysis does not find significant differences between sex in relation to all types of C-IPV. These results are in contrast to findings from a prior meta-analysis on cyber-bullying in which male participants were slightly more likely to engage in cyber-bullying behaviors than female participants among adolescents and young adulthood (Barlett & Coyne, 2014). However, our results support the empirical data in F2F-IPV literature pointing to an almost similar rate of men and women using violence (Stith et al., 2012; Straus, 2011, 2014). Moreover, our results support data of another meta-analysis on cyber dating abuse which found that being a girl or a boy is neither a risk nor a protective factor in the commission of, or victimization by, cyber dating abuse (Caridade & Braga, 2020). However, due to the low number of studies which examined the separate factors of cyber IPV, further studies are needed to suggest more strongly whether differences across gender exist as they do in other types of aggression. For instance, sexual aggression has been found to relate more to men while psychological aggression has been found more connected to women (Archer, 2000), which then can be perhaps correlated to the different types of cyber IPV.



### **Associations Between C-IPV and F2F-IPV**

The second section of our results addresses whether and how cyber IPV relates to traditional F2F-IPV. The findings that emerge from examining the associations between these phenomena show positive large effect sizes for the correlations between cyber IPV and F2F-IPV, both for perpetration and victimization and also when analyzed separately by sex. This means that these two phenomena are highly connected. These findings indicate that being aggressive towards a partner in face-to-face IPV, increases the potential of being aggressive towards a partner in cyber IPV. Similarly, when a person reports being a victim of C-IPV, she or he has a significantly higher chance of also being a victim of F2F-IPV.

The large effect sizes of the associations between C-IPV and traditional F2F-IPV in our study also support the idea that C-IPV is associated with F2F-IPV, and that C-IPV may continue when partners are in close physical proximity (Draucker & Martsolf, 2010; Marganski & Melander, 2018). Moreover, the motivation behind the perpetration of C-IPV may be the same as the motivation for using F2F-IPV: to control partner behavior (Melander, 2010a). This perpetration may also relate to a gender role norm which contributes to aggressive behavior among men (Gilbar et al., 2021).

Whereas the study results support the idea that cyber IPV is strongly associated with traditional IPV, using sex as a moderator in the association between cyber IPV and F2F-IPV both for victimization and perpetration was not significant in relation to all types of IPV. Thus, the associations between these two phenomena did not differ by sex. These results – together with the results showing no sex differences in mean rates – suggest that sex might not play a role in this kind of violence. More specifically, these results support the notion that C-IPV operates as indirect IPV (Borrajo et al., 2015) that may go beyond gendered physical strength differences between men and women. In other words, the fact that C-IPV is not based on a physical act may create C-IPV perpetration by women similar to that of men. However,

the results of this analysis are constrained due to the low number of studies which examined sex differences in this topic. Therefore, further studies are needed to answer the question posed of the role of sex in C-IPV (Melander, 2010b; Schnurr et al., 2013).

### **Current State of Diversity in the Literature and Suggestions for Further Research**

Conducting this review of the literature has revealed not only the strength of the associations examined, but also the scope of the empirical literature at hand. Several issues are apparent, namely a range in gender, sexual orientation, geographical location, socio-economic status and education. In this study, we initially planned to include studies focusing on diverse populations, for instance, including individuals with diverse sexual and gender identities. However, to the best of our knowledge, only one study examined C-IPV specifically among those with a variety of sexual orientations – lesbian, gay, and bisexual individuals (Trujillo et al., 2020). Another study compared C-IPV among those with a same-sex orientation to those with a heterosexual orientation (Zerach et al., 2016). Although these studies included a sufficient number of participants to be included in a meta-analysis, two studies are insufficient to use for statistical calculations in a meta-analysis, which is based on a number of studies with the same kind of data. Additionally, no study has examined C-IPV *vis a vis* individuals with a non-binary gender. The lack of studies among the LGBTQ+ populations raises the need to increase efforts to study C-IPV among these populations. This is particularly essential as surveys and research suggest that LGBTQ+ individuals are at an increased risk of F2F-IPV and of C-IPV (Charak et al., 2019; Edwards et al., 2015). A related point concerns analysis by race and/or ethnicity. While the current literature does not permit analysis that addresses these constructs, we would like to note that addressing these characteristics in future studies might give an important cross-cultural element to our understanding of IPV.

A further point pertaining to the scope of the literature is that of geographical location.

Most studies are from the United States with only one study from a low- and middle-income area (e.g., in the U.S.: 26 studies, and in Europe: 13, compared to Africa: 1 (Darko et al., 2019). Next, we note age and socio-economic limitations. Most studies within the meta-analysis examine C-IPV among youth and young adults. The mean age of participants in the meta-analysis was around 25 years of age. This suggests that the participants were part of student-based populations, which may, in turn, over represent relatively higher socio-economic status and higher education. Therefore, further studies should focus also on older individuals and those with a lower socio-economic status. Lastly, we note that, surprisingly, many of the studies which we included in the meta-analysis did not address sex or type differences, specifically regarding cyber sexual aggression and sexual assault; these studies reported on results of males and females together and/or without any division according to types of IPV. Further studies might be able to add knowledge by reporting on these divisions as well.

### **Limitations**

Several limitations should be kept in mind when interpreting the present findings. As Brown & Hegarty (2018) suggested, the research method used to measure C-IPV is a significant factor for accurately describing the phenomenon. Thus, differences in measurement methods of the included studies call into question the averaging of results across different studies. Additionally, only some of the studies used validated measurements of cyber IPV (e.g., Watkins et al., 2018) and others used single item measures of cyber IPV perpetration and did not report the psychometrics of the questionnaire used (see Table 1). While the extent to which measurement differences could affect the present findings remains unclear, further research should only include those studies with validated methods of measurement for C-IPV (Taylor & Xia, 2018), and that were based on a clear and accepted definition of the phenomenon. In the current study, while realizing these limitations, we (1)

addressed the quality of each study; and (2) removed a study which had a low quality of methods based on our application of our study-quality criteria.

A further limitation of our results lies in the limited scope of the studies used and their failure to address diverse populations (e.g., populations with various gender identities and race), in the limited attention given to cyber sexual aggression and cyber sexual assault, and in the inability to examine some of the results by sex due to the small number of studies.

While this is not a limitation of the current study – but rather of the current state of the literature – it is important to note this, as it reflects limitations of the generalizability of our results.

### **Practical Implications**

An impressive number of research reports converge to conclude that C-IPV is a manifestation of aggression between partners (Taylor & Xia, 2018). Hence, this meta-analysis could be informative to both practitioners and policy makers. Given the large effect sizes (0.27-0.61) of the associations between C-IPV and F2F-IPV, cyber IPV should be adequately addressed through effective preventive programs. Specifically, we need to underscore that while the present meta-analysis found significant effect sizes linking F2F-IPV to C-IPV, a large effect size still does not mean these two phenomena are essentially the same. Thus, traditionally, efforts have not focused on screening individuals who could be at risk of being a perpetrator or victim of C-IPV among those who recently engaged in perpetrating or being victimized by F2F-IPV. This should change. Additionally, the majority of programs helping to prevent C-IPV are universal programs originally designed for F2F-IPV victims (Cheng et al., 2019). Our analysis highlights that when assessing F2F-IPV, there is also a need to assess cyber IPV, and to ultimately integrate C-IPV prevention into IPV-prevention programs. In addition, based on our results – showing no significant differences between the sexes regarding the associations between the two forms of IPV – interventions focusing on cyber

IPV should include both men and women (Taylor & Xia, 2018). Moreover, the high correlation between C-IPV and F2F-IPV may raise the issue of whether the gender role norm impacts the use of cyber aggression by men. Therefore, prevention and response programs that focus primarily on face-to-face IPV and gender role norm should also relate to C-IPV. This is particularly relevant because focus upon sexist beliefs and attitudes has been found to be effective in prevention intervention of dating C-IPV (Galende et al., 2020).

Additionally, as a preventive strategy, technology developers can focus their efforts on creating applications or social media platforms that are more secure and user-friendly, and that enable victims to better protect themselves (i.e., easier features in social media to protect privacy; Al-Alosi, 2020; Dragiewicz et al., 2019). Specifically, given that technology/online spaces can be used to control and threaten a partner, clinicians could work collaboratively with technology consultants to assist victims of cyber IPV in learning secure and private ways of using technology (Freed et al., 2019), and to develop online safety strategies for victims (Woodlock et al., 2020). Third, there is need for the creation of specific regulations to protect victims of C-IPV and to provide educational training about C-IPV. This includes those who interface with victims of F2F-IPV, within, for example, law enforcement agencies and judicial tribunals (Dragiewicz et al., 2019).

In summary, this study is the first to investigate cyber IPV using a meta-analytic approach. Overall, the study results introduce important findings regarding the presentation of this phenomenon as one separate from, albeit related to, traditional F2F-IPV. While no sex differences between the different types of C-IPV have been found, further and broader studies may find sex differences within C-IPV and between C-IPV and F2f-IPV. More studies are also needed that focus on heterogeneous populations with specific attention paid to the different types of cyber IPV.

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