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Anonymity and Online Self-Disclosure: A Meta-Analysis

Cathlin V. Clark-Gordon, Nicholas D. Bowman, Alan K. Goodboy, & Alyssa Wright

When an individual is anonymous online, they may communicate more boldly than they would in a face-to-face situation—a phenomenon called the online disinhibition effect. While much is known about the toxic effects of online disinhibition, social effects (such as self-disclosure) receive less scholarly attention. This meta-analysis (k = 14, random effects assumed) examined the relationship between anonymity and online self-disclosure as a form of benign disinhibition. Results indicated anonymity had a positive average correlation with self-disclosure (r = .184). However, there was substantial heterogeneity across studies that could not be explained by moderators including type of anonymity (visual or discursive), the measure of self-disclosure (self-report or content analysis), or the type of interaction task (social, task, none present).

Keywords: Anonymity; Benign Disinhibition; Meta-Analysis; Self-Disclosure

Anonymity is thought to impact how people behave online, in particular, how individuals might feel more disinhibited. Termed the online disinhibition effect (Suler, 2004), anonymity is one affordance that may influence people to act out more frequently or intensely than they would in person. Research has suggested anonymity may create a heightened sense of private self-awareness (increased salience of one's physical and affective states), which is then combined with reduced public self-awareness (lack of identifiability and/or accountability concerns; Scott, 1998). This anonymous condition, with high awareness of self and low awareness of

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others, is associated with significantly higher levels of spontaneous self-disclosure during computer-mediated communication (Joinson, 2001). Although most research on anonymity focuses on toxic outcomes such as trolling, flaming, and cyberbullying (Suler, 2004), anonymity may foster social outcomes as well, such as self-disclosure. This study sought to further explore the benign outcomes of online disinhibitive effects by examining the extent that anonymity may be contributing to self-disclosures. This study is informed by Suler's (2004) online disinhibition effect and Scott's (1998) theoretical model for anonymous communication.

Anonymity

Anonymity refers to "the degree to which a communicator perceives the message source is unknown and unspecified" (Scott, 1998, p. 387). In the communication discipline, the roots for studying anonymity are in Scott's (1998) theoretical model for anonymous communication, where he argued that anonymity must be viewed on a continuum from fully anonymous to fully identified and is seen as the degree to which one feels more anonymous or more identified. Scott argues self-disclosure to strangers is a common outcome of anonymity because individuals will reveal information to others when they feel they are unidentifiable and are unlikely to ever encounter the stranger again. Anonymity includes the constructs of visual anonymity, where there is no evidence for the physicality or presence of a message source, and discursive anonymity, where specific textual cues cannot be attributed to a specific source. Research has demonstrated that anonymous conditions afforded by websites, social networking sites (SNS), and social apps result in an increase in disinhibited behavior (Joinson, 2001; Pinsonneault & Heppel, 1997; Suler, 2004).

Benign Disinhibition and Self-Disclosure

Broadly, disinhibition has been conceptualized as the lowering of psychological restraints, which often serve to regulate behaviors in online social environments (Joinson, 2001). Suler's (2004) Online Disinhibition Effect (ODE) conceptualizes disinhibition as both toxic (often characterized by trolling or flaming behaviors) and benign (characterized by social outcomes that are not harmful in effect). Under conditions of benign disinhibition, "sometimes people share very personal things about themselves. They reveal secret emotions, fears, wishes" (Suler, 2004, p. 321). Therefore, theories advanced by both Suler and Scott (1998) provide that harmless (benign) self-disclosures can occur in anonymous conditions.

One key outcome of benign disinhibition in online environments is self-disclosure. Self-disclosure, or revealing personal information to others that they do not already have access to or knowledge of (Wheeless & Grotz, 1976), is considered a key outcome of computer-mediated communication (CMC). Early CMC research predicted that, given sufficient time, self-disclosures occur to the same or even greater intensity and intimacy in CMC contexts as in face-to-face

communication contexts (Walther, 1994). Feelings of disinhibition in online environments can lead to greater self-disclosures (Schouten, Valkenburg, & Peter, 2007). However, conflicting research exists on the bivariate effects of anonymity on self-disclosure. For instance, general self-disclosures (Joinson, 2001), and specifically disclosure of emotions (Lapidot-Lefler & Barak, 2015), are higher under conditions of visual anonymity than discursive anonymity. Yet, on social media, when discursive anonymity is maintained (usually via usernames or pseudonyms), there are increased levels of self-disclosure (Retelas, 2008). However, in an experiment that manipulated both visual and discursive anonymity, no differences were found in self-disclosure between the two conditions (Schouten, Valkenburg, & Antheunis, 2006). Reflecting this experimental result, Okdie (2011) claims that individuals who self-disclose online are not affected by anonymity. Interpretation of self-disclosures made anonymously also may differ among cultures, wherein Western cultures are more trusting of those who self-disclose, yet Eastern cultures may be more skeptical (see Yum & Hara, 2005).

Certain platform affordances also can be perceived as more or less anonymous. For example, avatars can evoke different perceptions of self-identity and, therefore, different self-disclosures (Kang & Yang, 2004). When given an opportunity to remain anonymous, such as a blog, the majority of individuals choose to identify themselves anyway in order to further personalize and contextualize posts (Knoll & Bronstein, 2014). Additional studies on bloggers reveal that increased visual anonymity is associated with less self-disclosure, wherein bloggers disclose more when they are visually identified (Hollenbaugh & Everett, 2013; Qian & Scott, 2007). The perceptions of how a message is received by a CMC audience may be related to private and public self-awareness, concepts frequently studied alongside anonymity (Joinson, 2001), and reinforce Scott's (1998) theory of anonymous communication, which posits that anonymity is a receiver-oriented variable.

Current Study

Although the argument that anonymity leads to increased self-disclosure exists at a theoretical level (cf. Schouten et al., 2007; Scott, 1998), empirical support for this association is mixed (see Joinson, 2001; Rains, 2014 for positive effects, Okdie, 2011; Snyder, 2004 for negative effects). One way to account for conflicting reports is by conducting a meta-analysis to average the effect sizes across studies and provide an overall summary effect between the two variables being studied. Thus, we use a meta-analysis to answer the first research question:

> **RQ1**: Is there an association between online anonymity and self-disclosure behaviors?

Another reason to conduct a meta-analysis is to explain potential heterogeneity in the documented effects between anonymity and self-disclosure. Moderators can explain systematic variation in effect sizes (i.e., heterogeneity) across studies. Based on extant literature, three moderators are included: anonymity type (visual or discursive), measure of self-disclosure (self-report or content analysis), and the type of interaction task (social, task, or none present).

Anonymity Type

The type of anonymity being studied, or manipulated, is important to understand the individual effects of visual or discursive anonymity or the combined effects of each. Visual anonymity is the most frequently studied (Joinson, 2001; Lapidot-Lefler & Barak, 2015), but discursive anonymity could be important. Visual anonymity is a lack of physical representation of the message source (Scott, 1998) and often is studied using the presence or absence of visual cues, such as profile pictures (Hollenbaugh & Everett, 2013). Discursive anonymity refers to when textual cues cannot be attributed to a specific source (Scott, 1998) and often is studied with the use of pseudonyms or usernames (Retelas, 2008). Visual (e.g., profile pictures without personal information provided) and textual cues (e.g., personal information or usernames provided without profile pictures) could have different effects on self-disclosure; for instance, visual cues may promote greater expression, nonverbal and otherwise.

Methods and Measures

Self-disclosure is measured in a variety of ways in CMC research, varying from different versions of self-reports, to content analysis, to trained observers watching chat rooms. Self-reports usually measure self-disclosure across dimensions of breadth, depth, valence, or frequency/duration (Wheeless & Grotz, 1976), whereas content analyses may count the use of first-person personal pronouns to account for the number of self-disclosures made, including: I, I'd, I'll, I'm, I've, me, mine, my, and myself (as in the method of Rains, 2014). Because one of these measures is behavioral (such as counting the actual number of self-disclosures made), and the others are self-report, this was included as a moderating variable to see if the measurement of these variables could be impacting the results.

Interaction Context

Situational contexts often are accompanied by certain social norms of interaction. When participants are given a task or a decision to complete together, they may not choose to disclose as much as they would in a social (getting-to-know-you) setting due to the perceived norms of these situations. When social goals are salient, they shape individuals' strategic selection and creation of messages, and they affect the outcomes of conversations to which they pertain (Walther, 2017). These norms may be more salient in face-to-face situations, but individuals still attend to them in online contexts (Nguyen, Bin, & Campbell, 2012), making this a potential moderator to be considered for the present study.

Given the extant research, anonymity type, measurement type, and interaction context may all moderate the bivariate association between online anonymity and self-disclosure behaviors. Therefore, we explore the second research question:

> **RQ2**: Can potential heterogeneity between anonymity and self-disclosure be explained by (a) the type of anonymity manipulated, (b) the methods and measures used, or (c) the interaction context of the self-disclosures?

Method

A comprehensive literature search was done in partnership with a research librarian at the host institution to seek out published literature, conference presentations, theses, and dissertations, presenting quantitative data analysis on the association of anonymity and self-disclosure. Manuscripts were coded on key variables, including moderating variables, by the primary researcher on this study.

Literature Search

Electronic databases were searched to find studies for inclusion in the meta-analysis (see Table 1). The discipline-specific databases were chosen to search across the fields of Communication Studies, Psychology, Sociology, Anthropology, and Computer Science, all of which study online communication and its effects on the individual and society. Google Scholar and Dissertation Abstracts were added to include some unpublished works as well as to further broaden the range of included disciplines. Search terms were selected to capture the various ways disinhibition and related practices are written about in the current literature. The search encompassed all available dates through February 1, 2018. Search terms varied slightly by database to take best advantage of vocabulary used in the disciplines. Study design limiters were used where available to reduce the number of qualitative studies and theory articles in the search results. More excluded terms were used in the Google Scholar search in an attempt to reduce an overwhelming number of irrelevant results.

From these six databases, 509 studies, dissertations, master's theses, and conference proceedings initially were identified as relevant to our meta-analysis, and were further coded for inclusion. Ninety-six were duplicates and were removed from these combined search results.

In an effort to secure unpublished work, calls were put out in the National Communication Association's Listserv (CRTNET), the American Psychological Association's Listserv, and the Association of Internet Research's Listserv. Additionally, eight authors who publish predominantly in this area were identified and contacted to ascertain if they had any unpublished data. These authors also were asked to share the request with other researchers they may know who publish within this area of scholarship. Cooper (2009) suggested this method as a way to find unpublished data and to access the "invisible college"; in other words, scientists who work within similar research areas and are influential may be aware each other's work (Cooper, Hedges, & Valentine, 2009). Two conference papers emerged as a result of this personal contact. After all searching processes, the total number scholarly works to be considered for inclusion in the meta-analysis was 511.

Inclusion Criteria

To be included in the meta-analysis, studies had to meet three inclusion criteria. First, studies had to contain quantitative measurements or manipulations of anonymity as the

Table 1 Literature Search

Database	Search Terms	Results
Communication and Mass Media Complete	anonym* AND (self disclosure OR disinhibition OR "opinion expression") AND ("computer mediated communication" OR online OR internet OR computer), Search modes: Boolean/Phase	26 results
PsycINFO	anonym* AND (self disclosure OR disinhibition OR "opinion expression") AND ("computer mediated communication" OR online OR internet OR computer) Methodology: Quantitative Study, Search modes: Boolean/Phase	53 results
Sociological Abstracts and ProQuest Dissertation Abstracts	ALL (anonym* AND (self disclosure OR disinhibition OR "opinion expression" OR self presentation) AND ("computer mediated communication" OR online OR internet OR computer) NOT qualitative)	64 results
Web of Science	(TS = ((anonym*) AND (self disclosure OR disinhibition OR "opinion expression" OR "self presentation") AND ("computer mediated communication" OR online OR internet OR computer) NOT (ethnography) NOT (qualitative))) Document Types: Article OR Book OR Book Chapter OR Data Paper OR Proceedings Paper	166 results
Google Scholar	allintitle: anonymity "self disclosure" OR disinhibition OR "opinion expression" OR "self presentation" AND "computer mediated communication" OR online OR internet legal privacy security trolling flaming deception lying aggression aggressive toxic (excluding citations)	296 results

independent variable and quantitative measurements of self-disclosure as the dependent variable. Notably, many studies regarding CMC self-disclosure may have included anonymity as a feature of the study design but manipulated and measured other variables, such as group or audience size in online chats. Because the effects of the anonymity are subsumed in other common CMC manipulations, such as group size (Raufman & Shahak, 2017; Scott & Bonito, 2006), these studies were not included in this meta-analysis. After this process was completed, the number of eligible studies narrowed to $k = 16$. Second, studies must have reported necessary statistical information, including sample sizes and

a correlation, effect size, or other statistical analysis of the relationship between anonymity and self-disclosure, to allow for the calculation and conversion of effect sizes. Third, studies must have been published or presented in the English language. Applying these two additional criteria excluded one study published in the Chinese language (Yun, 2009) and a second with insufficient data (Misoch, 2015). This decreased the final k to 14.

Coding of Moderators

Anonymity Type
Studies manipulated or measured visual anonymity, discursive anonymity, or a combination of both as a matter of inclusion for this analysis. To create a dichotomous moderator for subgroup analysis, visual anonymity was coded as 1 ($k = 6$) and other types of anonymity were coded as 0 ($k = 8$).

Self-Disclosure Measure
This moderator considers how the research measured self-disclosure in terms of its method: content analysis (i.e., using computer-assisted coding software or trained coders to identify self-disclosive behaviors or statements) or self-reported survey items (i.e., previously validated measures of self-disclosure). Those that utilized a survey method were coded as 1 ($k = 8$), and those that utilized content analysis were coded as 0 ($k = 6$).

Interaction Context
A code was created to encapsulate whether interactants were given a context or prompt in which to communicate or self-disclose (i.e., a task or social activity, coded as 1) or whether data collected was based on no prompt. This decision was made to best fit existing data, as some studies gave participants a context to communicate, and others had no prompt, so they were coded as 0.

For each study included in this analysis, its sample size, average correlation between anonymity and self-disclosure with 95% confidence interval, the relative weight of each study, and moderator coding is presented in Table 2.

Results

Data Analysis

A random effects model was tested because it allows researchers to "estimate the average effect on all possible studies and the variability of the effect sizes" (Cheung, 2015, p. 94). This approach assumes that any average effect across studies has variability associated with it, and that the k studies that are included in this meta-analysis are randomly sampled from a larger superpopulation. Comprehensive Meta-Analysis 2.0 (Borenstein, Hedges, Higgins, & Rothstein, 2006) was used to convert all effect sizes and statistical data into the metric of r, weighting the overall contribution

Table 2 Studies Included in Meta-Analysis

Study	N	r	95% Confidence Interval Lower limit	95% Confidence Interval Upper limit	r-w	Moderators a	Moderators b	Moderators c
Chen et al. (2016)	428	0.21	0.11	0.30	7.79	0	1	0
Hollenbaugh and Everett (2013)	154	0.39	0.25	0.51	7.44	1	1	0
Joinson (2001) Study 1	40	0.56	0.33	0.72	6.26	1	0	1
Joinson (2001) Study 2	42	0.54	0.32	0.71	6.31	1	0	1
Kang and Yang (2004)	243	0.18	0.06	0.30	7.62	0	1	0
Knoll and Bronstein (2014)	135	0.51	0.41	0.59	7.64	1	1	0
Lapidot-Lefler and Barak (2015)	144	0.03	−0.20	0.26	6.77	1	0	1
Ma, Hancock, and Naaman (2016)	307	−0.27	−0.37	−0.16	7.70	1	1	0
Okdie (2011)	289	−0.17	−0.30	−0.03	7.55	0	0	1
Qian and Scott (2007)	242	−0.08	−0.35	0.20	6.28	0	1	0
Rains (2014)	114	0.36	0.19	0.51	7.17	0	0	0
Retelas (2008)	400	0.16	−0.07	0.26	7.78	0	0	0
Schouten et al. (2007)	168	0.28	0.03	0.50	6.48	0	1	1
Snyder (2004)	120	−0.22	−0.38	−0.04	7.21	0	1	1

Note. Sample size of each study = N; Relative weight of each study = r-w; Moderator a = type of anonymity (1 = visual, 0 = discursive), b = measurement type (1 = survey, 0 = content analysis), c = interaction context (1 = context provided, 0 = no context for interaction).

of each study by its variance. Tests of heterogeneity in the present analysis were determined by the Q statistic and I^2, insofar as Q tests the null hypothesis that studies share a common effect size (Borenstein, Higgins, Hedges, & Rothstein, 2017), and I^2 quantifies the proportion of observed variance that reflects real differences in effect size, often conceptualized as a "signal-to-noise" ratio (Borenstein et al., 2017). Benchmarks for I^2 include 25% for low, 50% for medium, and 75% for high amounts of real variance that could be explained by moderators. Moderators were coded as dichotomous groups (1, 0) to allow for subgroup analyses. Prior to analyzing results, tests for publication bias were conducted as frequently published work only reports significant findings (Cooper et al., 2009). The Egger's regression intercept was 1.57 (95% CI = −4.72 to 7.86; t = 0.54, df = 12, p = .60). Therefore, Egger's intercept showed no significant intercept deviations from zero and, thus, no evidence of publication bias is apparent.

The random effects meta-analysis for self-disclosure (k = 14) yielded an average correlation (r) of .18 (95% CI: 0.04 to 0.33, see Figure 1). Tests of heterogeneity revealed the studies did not share a common effect size (Q = 180.22, df = 13, p < .001, I^2 = 92.79). Tau-squared (T^2), or the variance of the true effect size, was estimated at 0.07. Tau (T), or the distribution of the effect size around the summary
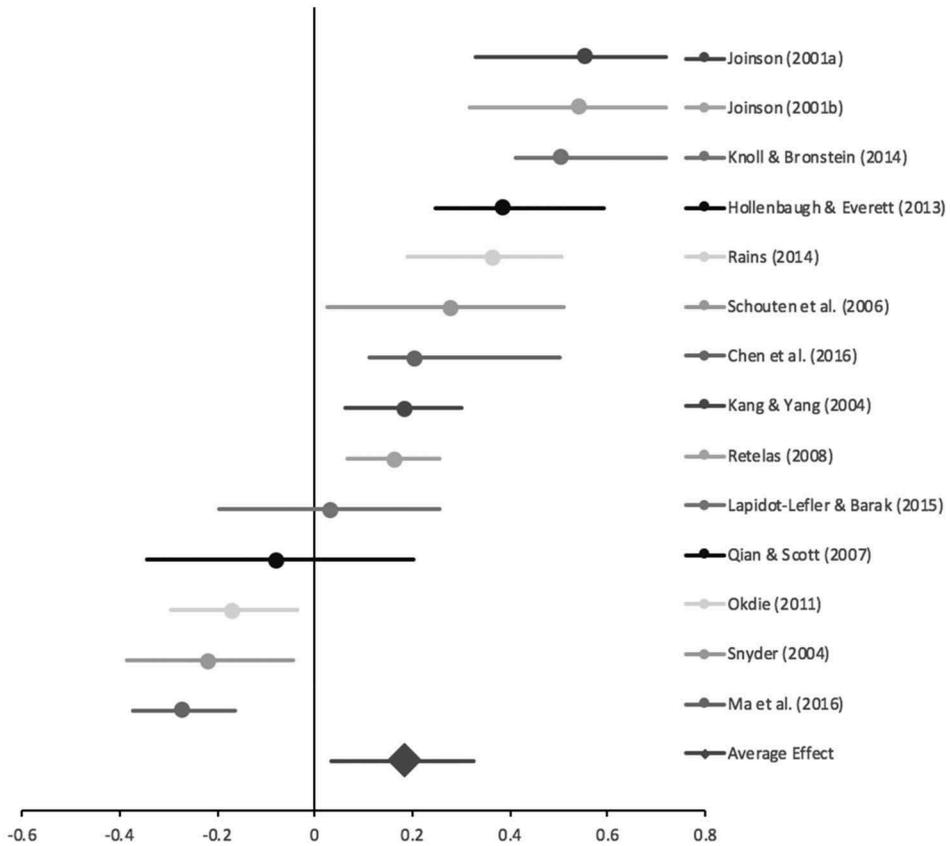
Figure 1   Forest plot of studies included in analysis.
Note. Each study included in the analysis is listed at right, each featuring an average correlation between anonymity and self-disclosure, enclosed by a line representing a confidence interval. The average effect of all studies is represented by a diamond.

effect, was 0.27. These data suggest the summary effect is statistically significant as the confidence interval excludes zero. However, the effect is heterogeneous, which suggests some moderators may explain additional variance in the averaged findings.

To answer RQ2, moderation subgroup analyses (Borenstein et al., 2017) were used to determine heterogeneity on the criteria set forth by the moderators. Hall and Rosenthal (1991) advocate for moderation subgroup analyses after a sample of effect sizes is shown to be significantly heterogeneous, or "the group of effect sizes is more variable than one would expect on the basis of sampling variation alone" (p. 439). A random-effects model was used within subgroups and a fixed-effect model was used between subgroups (Borenstein, Hedges, Higgins, & Rothstein, 2009, p. 183; Hall & Rosenthal, 1991). Here, "fixed" does not refer to the common-effect approach to a meta-analysis, but instead, statistically speaking subgroups are being "fixed" rather than random (i.e., anyone who performs the same subgroup comparisons

must use the same set of subgroups). To compute the mean effect and variance for each subgroup, Q_B was calculated (Borenstein et al., 2006). No moderators were able to significantly explain heterogeneity. No significant differences were found between studies that manipulated the type of anonymity ($Q_B = .13$, $p = .72$), that utilized different measurement techniques of self-disclosure, either via self-report or content analysis ($Q_B = .53$, $p = .47$), nor that required an interaction context for participants versus those that had no context ($Q_B = .03$, $p = .87$).

Discussion

This meta-analysis sought to summarize and clarify existing research on anonymity's effect on self-disclosure. The results of this analysis reveal that there is an effect ($r = .18$) but that effect is heterogenous. These results suggest a positive effect between anonymity and self-disclosure, but there is unexplained variability between each of the effects included in the analysis. The bivariate effect between anonymity and self-disclosure seems to be an understudied area. Only 14 studies were included in the final analysis, and the earliest studies were published in 2001. This suggests less than one study per year is conducted in this area of research. This may be because self-disclosures made via CMC are not necessarily synonymous with disclosures made under anonymous conditions. Many studies examine the differences between face-to-face and CMC self-disclosures. However, the CMC conditions in these studies do not presume CMC to be anonymous; rather, CMC is operationalized as a form of mediated communication that may reduce the available nonverbal cues in an interaction. In fact, work by Ruppel et al. (2017) suggests that self-disclosure was higher in face-to-face scenarios than in CMC scenarios, counter to early theories of CMC (e.g., Walther, 1994, 1996).

Although CMC conditions could be considered a degree of anonymity taking Scott's (1998) theoretical perspective, studies on CMC and self-disclosure, including those featured in Ruppel et al.'s (2017) meta-analysis, do not measure the degree to which disclosers perceived themselves to be visually or discursively anonymous. While anonymity was not the focus of the meta-analysis comparing CMC to face-to-face self-disclosures (Ruppel et al., 2017), it could potentially be an explanatory mechanism for greater CMC disclosures, which would align with the finding of the present analysis. Further, studies that explore differences between CMC and face-to-face disclosures might not consider the impact of perceived anonymity because anonymity is largely studied in tandem with groups and group cues, as anonymity is a key assumption of the social identity and deindividuation (SIDE) model (Postmes & Spears, 1998). The belief that individuals who act antinormatively are actually acting in line with an in-group is supported by SIDE, but this model does not explain the connection between anonymity and spontaneous self-disclosure. To this end, one area of future work might be to both (a) consider anonymity as a continuum rather than binary state (Scott, 1998) and (b) to disentangle anonymity from group-level constructs.

Importantly, cues-filtered-in approaches to CMC, such as social information processing theory (SIPT) and similar theories of online relational development (Walther & Parks, 2002), commonly situate self-disclosure as a potential outcome. Self-disclosure is a key aspect of relational development (Wheeless & Grotz, 1976), no matter the medium. And, SIPT (Walther, 1994), for instance, argues that given sufficient time, relationships can develop to the same level of intimacy and closeness in CMC contexts as they do in face-to-face contexts. This analysis found that overall, anonymity is impacting self-disclosure in online environments, supporting early theories of CMC. However, more often than not, the studies included in this analysis (and others found in the literature search but not included in analysis) did not treat anonymity as a continuous construct, despite Scott's (1998) theoretical suggestions. Rather, anonymity frequently is treated as a binary variable, making it difficult to understand the full spectrum of potential changes in self-disclosures and other social outcomes.

CMC research also demonstrates that environments with reduced nonverbal and parasocial cues increase online self-disclosure (i.e., Schouten et al., 2007), but this research does not consider the potential perceptions of anonymity when reducing cues in an online environment. Of the studies included in the present meta-analysis, two used continuous measurements that were developed for the context of the specific studies (meaning different items were used in each study). While one study found a positive effect of perceived anonymity on self-disclosure (Chen, Gang, Hu, & Li, 2016), the other observed a negative effect (Snyder, 2004). This highlights the need for a validated measure of perceived anonymity with sound psychometric properties rather than creating items on a study-by-study basis. Future research regarding interactions in environments with reduced cues (i.e., degrees of anonymity) should consider the potential for perceived anonymity and how it could potentially impact the interactions studied, being careful to isolate anonymity in experimental research rather than entangling it with group cues or audience size or type in factorial designs. Further, the degree of perceived visual anonymity, such as not having profile pictures or other information about an interactant's physical appearance, and the degree of perceived discursive anonymity, such as an interactant's identity (e.g., location, occupation, age) could both have varied effects. By carefully conceptualizing and operationalizing perceived anonymity as a continuum in future research (i.e., Scott, 1998), perhaps such heterogenous effects can be reduced.

In the context of this study, however, the total effect was heterogeneous, suggesting moderating variables exist that could explain the variance in the findings. Although the literature suggests several moderating variables, neither interaction context, type of anonymity, or how self-disclosure is operationalized was able to significantly explain the heterogeneity present in the sample. This occurred, perhaps, because extant literature is sparse (as represented by the 14 total studies identified in nearly 20 years of research on the topic). Additionally, some comparisons could not be made using subgroup analyses due to unbalanced group distributions. For example, for the interaction context moderator, very few studies utilized a task interaction prompt for participants ($k = 5$), and only one study specified that a social

prompt was given ($k = 1$), which was insufficient for conducting the necessary analysis (Borenstein et al., 2009). To combat these limitations, those studies that provided an interaction context were grouped and compared against those that did not. As more research is published in this area, interaction context could emerge as a moderator of the impact anonymity has on self-disclosure, but there is simply not enough evidence yet to determine such an effect currently. Further, there is no consistency in research approaches between the various manipulations, measures, and methods used to collect data. This may mean that present research is not truly capturing the full range of behaviors, or the studies analyzed are capturing it so uniquely in each study that they are not ruling out spurious variables.

Conclusion

This meta-analysis revealed a positive relationship between anonymity and self-disclosure online. However, only 14 studies were located that tested or measured anonymity and its association with self-disclosure. More research needs to be conducted on the social effects of anonymity. Early CMC researchers predicted that mediated self-disclosure would occur with equal or greater intensity and intimacy than in face-to-face relational development (Walther, 1996). This meta-analysis offered support for this claim, as anonymity granted through CMC has a positive correlation with self-disclosure. However, future research needs to explain the variance in this finding and consider anonymity as a fully continuous (instead of dichotomous) construct.

Disclosure statement

No potential conflict of interest was reported by the authors.

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