Can Bloggers Accurately Report their Self-Disclosure Behaviors? An Equivalence Test of Self-Report and Content Analysis Data

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Online self-disclosure is a complex and multi-faceted construct that brings with it several measurement concerns. The purpose of this study is to compare bloggers' self-disclosure as measured through self-report questionnaires and quantitative content analysis to determine whether these measurements yield the same results, and therefore may be used interchangeably in research. Equivalence testing of self-report data and content analyzed archived blog posts from 154 personal journal bloggers showed that data from these two measurements were not equivalent using a conservative test; however, they were no different than the average effect size in communication research, which is a more liberal test. This study has implications for measuring online self-disclosure, and future research directions were suggested to help refine self-disclosure measurement.

The Internet is undeniably a popular medium for communicating interpersonally, and online self-disclosure has become a popular area of interest for communication scholars. Self-disclosure has traditionally been seen as the building block of relationships, with increased disclosure being related to increased relational development and intimacy (Altman & Taylor, 1973; Vangelisti & Caughlin, 1997). However, new technologies are also changing, or at least raising questions about the norms of self-disclosure. For example, the nature of public blogs seems to point to "apparent contradictions between what we know about self-disclosure in other contexts versus what is now a common practice on the World Wide Web" (Lee, Im, & Taylor, 2008, p. 696). Our prior understandings of the important factors in self-disclosure may now be different. Online self-disclosure is studied not only in relation to interpersonal relationships, but also Internet services, applications, systems, and commerce (Joinson, Paine, Buchanan, & Reips, 2008). Chat rooms, discussion and support forums, social media sites,

and blogs are among the online contexts for operationalizing, measuring, and understanding self-disclosure – in comparison to each other, in their own right, in comparison to face-to-face communication, or in relationship to other variables such as privacy (Choi & Bazarova, 2014; Frye & Dornish, 2010; Stuzman, Capra, & Thompson, 2011) and anonymity (e.g., Bailenson, Yee, Merget, & Schroeder, 2006; Chiou, 2006, 2007; Joinson, 2001; McKenna & Bargh, 2000).

When studying self-disclosure, as when studying any concept, it is imperative to use measurements that yield the most valid data possible. However, in a practical sense, there may be real-world limitations on scholars' resources that play a role in their choice of methodology. Therefore, it is important to test whether the findings from different methodologies are statistically equivalent, and indeed accurately measuring the same concepts.

An expedited research program is helpful to quickly advance knowledge related to technology use, but only if it is based on valid measurement. In a research climate where Internet use is accelerating faster than many researchers can keep up with, self-reports offer a relatively quick and comprehensive data collection method (Metts, Sprecher, & Cupach, 1991). On the other hand, content analysis can be applied in a reliable and valid way to measure online disclosure that has been archived through one's blog or Facebook timeline, for example. Though it typically takes more time to collect and code data using quantitative content analysis, the data are not affected by such problems as participant memory loss or need for social approval. Additionally, a large amount of data is readily available to researchers. Both methods of data collection have been used frequently to collect data on self-disclosure, and it is important to compare the two to determine whether they can be used interchangeably to measure online self-disclosure.

The purpose of this study is to determine whether or not bloggers' recall of self-disclosure behavior through self-reports is consistent with analyses of the disclosures themselves. If different measurements yield the same results across self-disclosure dimensions, then researchers can assume that self-reports are accurate measures of disclosure behavior. On the other hand, if scores are significantly different across measurements, there will be more cause for concern when researchers ask participants to self-report their disclosure behaviors, as this measurement may not be as accurate as content analysis. In a review of three meta-analyses of self-

disclosure research, Dindia (2002) concluded that observational measures of self-disclosure are preferable to self-reports when possible, as observational data is less susceptible to individuals' preconceived notions about self-disclosure. A brief review of literature is presented to describe the complications inherent in measuring online self-disclosure, followed by a summary of the present study.

Literature Review

The study of self-disclosure in online communication is complicated by a number of factors, including the context in which the disclosure takes place as well as the chosen form of measurement. Researchers have demonstrated that self-disclosure is impacted by the nature and purpose of communication contexts and their associated contextual factors (Antaki, Barnes, & Leudar, 2005; Barak & Gluck-Ofri, 2007; Frye & Dornish, 2010; Tidwell & Walther, 2002). A related feature of this complexity is the way in which self-disclosure is operationalized and measured. Different ways of conceiving and measuring self-disclosure seem to result in different findings (Collins & Miller, 1994). Self-disclosure is understood to be revealing personal information (Derlega, Metts, Petronio, & Margulis, 1993), but how that information is revealed and evaluated can differ. For example, numerous studies of online self-disclosure have investigated the degree to which people disclose identifying and personal information about themselves (such as name, age, religious affiliation) in profiles (Bobkowski & Pearce, 2011; Boyle & Johnson, 2010; Mesch & Beker, 2010; Nosko et al., 2010; Special & Li-Barber, 2012; Taddicken, 2014). Conversely, personal journal blogs are also characterized by high amounts of disclosure (Bortree, 2005; Mazur & Kozarian, 2010; Viegas, 2005), but the type of self-disclosure in the content of a personal journal blog differs from private information such as name and age because it allows for more developed reflection on various kinds of personal information, including thoughts and feelings (Lee et al., 2008; Mazur & Kozarian, 2010).

Other self-report measures ask about feelings about communicating online (Ledbetter et al., 2011) or ask survey respondents to indicate their disclosure practices (Stutzman et al., 2011). Still other self-report measures assess a combination of depth and breadth. For example, Valkenburg, Sumter, and Peter (2011) asked participants to indicate how much they usually tell friends (tell nothing, tell everything) about things such as personal feelings or things they worry about. Other measures ask

respondents to indicate the degree to which they would be comfortable discussing a particular topic of varying intimacy levels (Attrill & Jalil, 2011; Frye & Dornisch, 2010; Rubin & Shenker, 1975). These varied measures of self-disclosure all require participants to recall their disclosure behavior or consider a very general context, which may not indicate their actual behaviors but instead, their perceptions and beliefs about their behaviors.

Another aspect of the context for self-disclosure relates to participants' motives, or reasons for using media. Motivations for why people self-disclose online are varied and distinct and can include self-presentation as well as managing relationships, keeping up with trends, sharing information, or storing information (Hollenbaugh & Ferris, 2014; Lee et al., 2008). However, motivations for disclosure on Facebook (Waters & Ackerman, 2011) differed from those for blogging (e.g., Chen, 2015; Lee et. al, 2008). These findings support the argument that "disclosure is by no means constant; context plays an important role in helping to shape disclosures" (Frye & Dornish, 2010, p. 1120).

Although context itself creates a number of complications in the study of online self-disclosure, different measurements may also present another complicating factor. Both self-report and content-analysis methodologies have been employed in studies of online self-disclosure. A common self-report measure utilized in online self-disclosure studies is Wheeless' (1978) Revised Self-Disclosure Scale adapted to the particular contexts being studied (e.g., Chen & Marcus, 2012; Park, Jin, & Jin 2011; Stefanone & Jang, 2007; Tidwell & Walther, 2002; Yang, Yang & Chiou, 2010). These adaptations ask respondents to indicate their disclosiveness using prompts about the frequency with which they engage in particular disclosive behaviors such as "I often write about myself in my blog entries … I often disclose intimate, personal things about myself in my blog entries without hesitation" (CITATION REMOVED FOR BLIND REVIEW). Additional items have been added to these reports to assess aspects of honesty and intent (Park et al., 2011). An advantage of these measures is that researchers can examine the consistency between self-report data about general disclosiveness and disclosiveness in a particular context in the same measure (Yang et al., 2010).

Although self-reporting has been used widely, quantitative content analysis has also been employed in studies of various online contexts to measure self-disclosure. The challenge in these measures is the operationalization of self-disclosure and how to score it (Joinson & Paine,

2007). What "counts" as breadth and depth can also vary considerably. For example, some studies have focused on counting and cataloging the disclosure of information on profiles, often by noting its presence or absence (Bobkowski & Pearce, 2011; Nosko, Wood, & Molema, 2010). A more recent study on self-disclosure in health blogs measured self-disclosure simply as the percentage of first-person pronounce (i.e., I, me, etc.) appearing in the total word count of participants' blog posts (Rains, 2014). Breadth has also been operationalized in several varying ways, as the amount of information disclosed and subsequently measured by counting topics, the amount of time spent talking, or the number of self-oriented comments (Collins & Miller, 1994). Depth (or degree of intimacy of information being revealed) can be determined by evaluating the intimacy of disclosing about a particular topic (Joinson, 2001, Joinson et al., 2008). More complex rating schemes have also been developed to capture the ways in which people can disclose at various levels of depth about any given topic or category (Altman & Taylor, 1973; Barak & Gluck-Ofri, 2007; Tidwell & Walther, 2002).

Hypotheses

Scholars use both self-reports and content analysis to measure online self-disclosure, building upon existing research regardless of the specific measures used. In practice, researchers have been utilizing varying measurement tools that may or may not be as equally accurate for measuring self-disclosure. Therefore, the following hypotheses are posited in this study to test that assumption:

> H1: Bloggers' amount of self-disclosure will be statistically equivalent when measured through self-report as compared to content analysis.
>
> H2: Bloggers' breadth of self-disclosure will be statistically equivalent when measured through self-report as compared to content analysis.
>
> H3: Bloggers' depth of self-disclosure will be statistically equivalent when measured through self-report as compared to content analysis.

Method

To test the hypotheses, data from two studies with the same group of participants were compared. The data included both self-report responses of participants' self-disclosure and sefl-disclosures in archived blog posts coded by research assistants, allowing the researchers to compare the reported and observed self-disclosure scores on each of the three dimensions of self-disclosure.

Participants

The sample included 154 English-speaking bloggers. Participants posted at least once per month to their personal journal blog, defined as blogs composed of short posts concerning the blogger's life and internal self (Blood, 2002). Personal journal blogs were chosen over other types, such as political or news blogs, because they are characterized by more self-disclosure than other types (Herring & Paolillo, 2006). The sample was composed of mostly Caucasian bloggers (80.5%) living in the United States (84.4%). Like the population of personal journal bloggers (e.g., Herring, Kouper, Scheidt, & Wright, 2004; Lenhart & Fox, 2006; Tian, 2011), the sample was majority female (73.4%). Their ages ranged from 18 to 70 (M = 32.22, SD = 12.19). Participants reported posting to their most active blog an average of 16.61 times per month (SD = 13.74).

The researchers used a convenience sampling method; however, the call for participation was posted on a variety of venues and participation was solicited in a variety of ways, similar to the recruitment strategies used in other blogging research, in an attempt to yield a diverse sample (e.g., Kaye, 2005; Qian & Scott, 2007; Viegas, 2005). To reach a wide audience of active bloggers, the researchers emailed featured bloggers on two popular blogging sites (Blogger.com and Xanga.com) asking them to post a link to the online survey. The researchers also contacted individual bloggers on Livejournal.com, Blogger.com, and Wordpress.com, asking them to participate in the study. These potential participants were identified through the sites' random feature, list of most recently updated blogs, and bloggers' lists of blogs they are reading. In total, 297 individual bloggers were personally contacted. Additionally, the researchers posted announcements on eight discussion boards and six listservs that bloggers are likely to frequent.

Procedure

Self-disclosure dimensions were measured in two ways to allow the researchers to test the equivalence of these scores. The self-report measure was administered online through SurveyMonkey.com. Participants who completed the self-report questionnaire also supplied the Web address for their most frequently updated personal journal blog. Subsequently, a research assistant collected archived posts from participants' public blogs to serve as data for a quantitative content analysis. The five most recent posts prior to the date the survey was distributed were collected for each blogger. Below is an explanation of how study variables were computed.

Measures

Self-report measure. Participants were directed to think about their self-disclosures in their blog entries on their most frequently updated personal journal blog. Then, they completed Wheeless' (1978) Revised Self-Disclosure Scale (RSDS), which was altered to fit the blogging context. Two subscales of the RSDS were used to measure amount (seven items, α = .81) and depth of self-disclosure (five items, α = .81). Although there are a variety of self-disclosure self-report measures available, the RSDS was chosen due to its frequency of use and validity and reliability across numerous studies (Graham, 1994). This topic-free, multi-dimensional measure can be adapted to most any context (Wheeless & Grotz, 1976); therefore, it has been quite useful to researchers.

A close examination of the RSDS showed that breadth of self-disclosure, a dimension central to much self-disclosure theory (e.g., Altman & Taylor, 1973), was not represented in the RSDS. Therefore, five items were created to measure this dimension, which was found to be reliable (α = .82). Items included "My blog entries are limited to just a few specific topics. (RC)," "My blog entries range over a wide variety of topics," "Once I get started writing in my blog, I move easily from one topic to another," "My blog entries address a variety of subjects, and "My blog entries tend to center around one subject of interest (RC)." See Table 1 for means and standard deviations of all study variables.

Table 1: *Means and Standard Deviations of Self-Disclosure Raw Scores*

	Self-Report		Content Analysis	
	M(*SD*)	Possible Range	*M*(*SD*)	Possible Range
Amount of self-disclosure	3.25(.71)	1-5	14.82(7.30)	0-120
Breadth of self-disclosure	3.70(.80)	1-5	4.38(1.53)	0-8
Depth of self-disclosure	2.55(.82)	1-5	1.58(.18)	1-3

Content analysis measurement. Using existing research (e.g., Altman & Taylor, 1973; Harper & Harper, 2006; Jourard, 1971; Jourard & Lasakow, 1958; Tidwell & Walther, 2002), the researchers assembled a coding structure and trained two research assistants to code each participant's five blog entries for amount, breadth, and depth of self-disclosure. Each entry served as the unit of analysis (*n* = 154 participants x 5 blog entries = 770). Coders identified each self-disclosure in the blog entries, defined as "personal information revealed about one's self, inner states, feelings, or opinions." The self-disclosures were coded as belonging to one of eight categories: biographic, sex, school and work, current events, physical appearance and condition, hobbies and interests, money and property, relationships with others (Taylor & Altman, 1966; Tidwell & Walther, 2002). When coding an instance of self-disclosure, coders also identified the depth level (1 – superficial, 2 – intermediate, or 3 – core; see Altman & Taylor, 1973, for explanation of depth categories). Each topic/depth code was only recorded once in a blog entry so, for example, when a level two disclosure about current events occurred in a blog entry, it could not be coded again until the next blog entry.

Interrater reliability for the two coders was continually assessed throughout the training process until it was acceptable for 20% of the data (see Table 2 for reliability estimates for coded variables). Following training, the remaining data was split between the two coders and coded independently. Amount of self-disclosure was computed by summing the total number of self-disclosures across all five blog entries. To measure breadth of self-disclosure, the researchers computed the number of categories out of the possible eight that bloggers disclosed about in any of

their five blog entries. Depth of self-disclosure was calculated by averaging the depth scores (1-3) across all coded instances of self-disclosure.

Table 2: *Frequencies and Reliability Coefficients for Coded Variables*

	n(%)	Cohen's kappa
Breadth categories		
Biographic Information	149(96.8)	.920
Sex	9(5.8)	.854
School and Work	100(64.9)	.924
Current Events	58(37.7)	.832
Physical Appearance and Condition (Body)	59(38.3)	.930
Hobbies and Interests	135(87.7)	.812
Money and Property	106(68.8)	.868
Relationships w/ Others	59(38.3)	.874
		Krippendorf's alpha (ratio)
Levels of Depth		
Depth 1	149(96.8)	.8153
Depth 2	153(99.4)	.7933
Depth 3	69(44.8)	.8557

Note. Frequencies for breadth and depth categories reflect the number of participants who were coded as having at least one disclosure in the respective categories.

Results

The hypotheses predicted there self-report and content analysis scores on participants' amount, breadth, and depth of self-disclosure would be statistically equivalent. To test these hypotheses, we conducted three separate dependent/paired samples equivalence tests (Weber & Popova, 2012) on each pair of z-scores for each of the three dimensions of self-disclosure. After consulting Weber and Popova's (2012) meta-analysis on effect sizes across communication content areas, we chose the minimum

substantial effect size (Δ) .10. As Cohen's (1988) general guideline for a small effect size, Δ = .10 falls between the 25th and 50th percentile of |*r*| in Weber and Popova's (2012) report on meta-analyses in interpersonal communication research effect sizes. Because we tested whether or not two measures of the same variable were statistically equivalent, we deemed it necessary to choose a conservative Δ effect size.

Hypothesis Testing

When using Δ = .10, none of the equivalence tests were significant (see Table 3). Participants' scores on amount of self-disclosure when measured by self-report were not statistically equivalent to their scores on amount of self-disclosure measured by content analysis. The same was true for breadth and depth (see Table 3). Therefore, all study hypotheses were rejected by the conservative testing method.

Table 3: *Dependent/Paired-Samples Equivalence Tests of Self-Report and Content Analyzed Self-Disclosure Z-Scores*

	Δ	*t*(df)	*p*, two-tailed
Amount	.10	-.05(152)	.087
	.16	-.05(152)	.013
Breadth	.10	.00(153)	.079
	.16	.00(153)	.012
Depth	.10	.01(152)	.081
	.16	.01(152)	.012

Post Hoc Analysis

Weber and Popova (2012) explained that it may be appropriate to explore equivalence test results "assuming a *range* of plausible Δ effect sizes" (p. 194). Therefore, to further examine the relationships among study variables, we ran post hoc tests using Weber and Popova's (2012) Δ = .16, the average effect size in communication research. This more liberal Δ effect size yielded very different results. Each of the three dimensions of self-disclosure were statistically equivalent in the post hoc tests (see Table 3). In other words, the statistical differences between scores assigned from self-report and content analyses were significantly smaller than the average communication research effect size.

Finally, we examined correlations among the participants' raw scores (i.e., not z-scores, as in other analyses) as another means of exploring their relationships. One would expect that if the scores computed from self-report and content analysis are functionally the same, then they should also be highly correlated with one another. Self-report and content analysis scores of amount of self-disclosure were positively correlated, $r = .32$, $p < .001$. The same was true for breadth of self-disclosure, $r = .24$, $p < .01$. However, neither of these correlations were strong, according to commonly accepted rules of thumbs. On the other hand, self-report and content analysis scores of depth of self-disclosure were far from significantly related, $r = .00$, $p = .995$.

To further inspect the curious relationship between the depth scores, additional analyses were conducted. It is possible that the content analysis procedures for coding depth (1-3) did not yield enough variability to correctly compare the two methods of gathering data. Therefore, researchers assigned participants into two groups – high and low content analysis depth – using a mean split. There were 73 participants (47.4%) in the high content analysis depth category and 81 (52.6%) in the low category. If these measures yield statistically equivalent scores, then there should be a significant difference in self-reported depth of self-disclosure between these two groups. However, an independent samples t-test was not significant, $t(151) = .31$, $p = .76$, which did not support Hypothesis 3.

Discussion

The purpose of this study was to test whether bloggers' scores on self-disclosure dimensions are statistically equivalent when measuring through self-report and quantitative content analysis. This study will help determine whether these two popular data collection methods can be used interchangeably to measure dimensions of online self-disclosure. The results demonstrated that scores for amount, breadth, and depth of self-disclosure were not statistically equivalent across self-report and content analysis when using a conservative approach. However, post hoc tests revealed some interesting findings that will be discussed here.

The primary conclusion to take from this study is that self-report and content analysis are not equivalent in a strict sense; however, using a more liberal approach ($\Delta = .16$), all three dimensions were found to be equal. Considered in combination with correlation analyses, it appears that bloggers' reports of their amount and breadth of self-disclosure is

somewhat accurate when compared to the more objectively measured scores revealed through content analyses. This conclusion should be made with caution, however, since they did not stand up to the more conservative Δ effect size. If researchers wish to use self-report and content analysis interchangeably in studying communication behaviors such as self-disclosure, they should be aware that these two approaches may not be measuring the same thing.

The results of this study should be troubling to many researchers. Often bound by practical restrictions such as time and money, many communication scholars choose to measure self-disclosure through self-reports. However, results from the present study suggest that some populations (bloggers, in this case) are only moderately accurate in reporting the amount and breadth of their self-disclosure. We suggest content analysis when possible, as our memories are fallible and susceptible to stereotypes about self-disclosure (Dindia, 2002), but it is more difficult to argue the actual record (i.e., archived self-disclosure in blog posts). However, content analysis is certainly not perfect. Perhaps the most difficult self-disclosure dimension to quantify is depth, or intimacy of self-disclosure, given the subjective nature of this dimension.

The inconclusive results regarding the measures of depth of online self-disclosure point to the need for continued exploration of the most efficient and effective measurement tools for operationalizing this concept. In many ways these results are not surprising. Given that "self-disclosure is not simply the outcome of a communication encounter: rather it is both a product and process of interaction, as well as a way for regulating interaction dynamically" (Joinson & Paine, 2007, p. 235), research measures need to address these complexities. One of the challenges of classification schemes, especially for a complex construct such as self-disclosure depth, is determining mutually exclusive categories (Altman & Taylor, 1973; Tidwell & Walther, 2002). Self-report and content analysis measures must account for the ways in which all categories or topics do not appear to have the same weight with regards to how "personal" the self-disclosure is. For example, disclosing information about sex is more personal by virtue of the topic than disclosing about current events (Altman & Taylor, 1973; Rubin & Shenker, 1975). Therefore, a core piece of information about sex is likely more personal than a core disclosure about current events. To further complicate matters, talking about sex may be considered more private and intimate to one person than it is to another, depending on their culture, personal

values, and even the intended audience. More studies are needed to demonstrate the reliability and validity of particular coding methods and their generalizability across online communication contexts. An alternate method to studying online self-disclosure is to turn to more macro-level predictions, such as the rules-based communication privacy management theory (Petronio, 2002, 2013). This theory defines self-disclosure simply as that which we consider private; attention is turned away from focusing on the *content* of private disclosures and instead toward the *management* of that information.

The findings of this study point to another promising focus for further research. Replicating this study in other online communication contexts with other frequently used self-report measures would strengthen the confidence of this conclusion and either further verify the validity of using self-report questionnaires or provide more caution to researchers when measuring online self-disclosure.

Content analysis offers an opportunity to measure real disclosure behavior in more nuanced and complex ways. These results can then inform the construction of self-report measures for communication variables such as self-disclosure. Given the multiple disciplines engaged in research programs investigating aspects of self-disclosure in online contexts, refined and tested measures that will corroborate each other are needed and important contributions for these fields.

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