

Data Richness Trade-Offs Between Face-to-Face, Online Audiovisual, and Online Text-Only Focus Groups

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Abstract

This study offers an examination of data richness (i.e., topic-related data, topic unrelated data, researcher ratings of data richness, word count, and linguistic characteristics of data richness) trade-offs between face-to-face (FTF), online text-only and online audiovisual focus group mediums. Two focus group sessions were held for each type of medium. Data were analyzed using systematic content analysis and Linguistic Inquiry and Word Count. Findings showed that although online audiovisual focus groups show potential for producing data similar in richness to FTF focus groups, researchers should carefully consider the potential distractions that manifested in this study as a result of the medium itself, likely due to its novelty as a group communication medium. Online text-only groups did not facilitate rich data, as operationalized in this study, and also had a lower amount of data related to the topic of the groups due to more socializing and off-topic discussion. As the first study to empirically examine the potential of data from focus groups facilitated via webcam (online audiovisual), it concludes, the technology offers similar data richness to FTF focus groups.

Keywords

focus groups, online research, qualitative data richness, data quality, computer-based qualitative data collection

Introduction

The Internet as a medium to facilitate focus groups has been examined and discussed frequently in the literature from many different angles in terms of how it compares with face-to-face (FTF) focus groups. These angles taken in previous work primarily centered on varying operationalizations of

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data quality. In terms of data quality, studies have varied in how they explored it as demonstrated in the following three studies. Underhill and Olmsted (2003) found that participants in both online text-only and FTF focus groups produced similar numbers of topic-related comments and unique ideas. Schneider, Kerwin, Frechtling, and Vivari (2002) found that online text-only focus groups led to shorter responses (interpreted as less elaboration) than FTF focus groups. Finally, Brüggem and Willems (2009) asserted that online text-only focus group data have less depth, because participants do not provide comments as lengthy as those by FTF focus group. These studies concluded that online text-only focus groups might have their place in research for their ability to capture the same amount of unique ideas as FTF focus groups with fewer words but do not offer the same level of depth. Data quality, as explored in these previous studies, tended to err toward various iterations of the length of participants' comments rather than the component of qualitative data that researchers typically are after: richness.

In the context of online focus groups, richer data can be captured through the use of audiovisual via webcams (Schneider, Kerwin, Frechtling, & Vivari, 2002). Yet, past research largely focused on experimental or qualitative comparisons between online text-only and FTF focus groups without considering the fact that online focus groups could be divided into online text-only and audiovisual focus group. Past research largely confined the concept of "online focus groups" to focus groups that used online synchronous text typing (e.g., Brüggem & Willems, 2009; Schneider et al., 2002; Underhill & Olmsted, 2003). However, we define online focus group as a focus group medium that applied online synchronous text, audio, or/and visual communications. Only since 2011 has the prevalence of online audiovisual communication and its usage increased due to the integration of webcams into desktops, laptops, and other devices (e.g., smart phones, tablets) and the advent of low-cost or free technology to use it (e.g., Google Hangout/Video, Skype; "Webcam penetration and adoption rates," 2011).

This study fills the current gap in the literature by addressing the potential of online audiovisual focus groups in producing good quality data and adds an alternative variable on which to compare data quality between focus group mediums: data richness. We first review the literature that has addressed the potential of online versus FTF focus groups on several dimensions followed by an explication of data quality and data richness in qualitative research and online focus groups to further situate the present study.

Focus Group Mediums and Their Trade-Offs

Numerous scholars have examined and explained the potential of online versus FTF focus groups; therefore, we have provided a summary in Table 1 at the completion of our explanation of this body of work.

To begin, online focus groups are distinguished from FTF focus groups in that they take place in a computer environment; however, the definition and purposes still remain the same as that of FTF focus group (Walston & Lissitz, 2000). Online focus groups can be divided into asynchronous (participants contribute during different times: e.g., e-mails) or synchronous (participants contribute during the same time: e.g., chat) group interactions. This work focuses only on online audiovisual and online text-only focus group, which are synchronous online focus group interactions.

FTF and online focus groups differ in the necessary time and cost devoted. FTF focus groups are considered costly and time consuming relative to online focus groups (Schneider et al., 2002). Online focus groups have advantages that can overcome what FTF focus groups lack. The most obvious advantage is that online focus groups do not depend on finding and paying for an ideal location and setting for them to take place, saving planners' and participants' time and money (Reid & Reid, 2005). The cost of hiring transcribers is also eliminated if the online medium is text only where transcripts are produced as participants type text (Walston & Lissitz, 2000). On a related note, these

Table 1. Summary of Trade-Offs Between Different Focus Group Mediums.

FTF Focus Groups		Online Focus Groups (Online Audiovisual and Online Text Only)	
Advantages	Disadvantages	Advantages	Disadvantages
Role of moderator - More control of moderator over discussion topics; - help avoid a few participants becoming dominant	Role of moderator - More control of moderator over the discussion topic (can be both advantage and disadvantage)	Role of moderator - Less control of moderator over discussion topics	Role of moderator - Less control of moderator over discussion topics (can be both advantage and disadvantage)
More data	Cost of money and time	Saves money and time - No need to find a physical location - no need to hire transcribers - no need to buy audio/visual equipment Participants' ability to track running scripts and catch up More active participation of diverse people Equal opportunity for participants to speak (less dominant participants)	Possible technical problems Scripts can be chaotic and irrelevant to topics Only people with Internet can participate Same number of topics may be covered but with less elaboration

computer programs offering audiovisual communication usually also have features that allow researchers to record all participants' online audiovisual feeds, thereby eliminating the need to purchase audio or video recording equipment. A drawback of online focus groups is the possibility of having technical problems (Schneider et al., 2002). Some participants might drop out in the middle of the discussion or they might not even be able to take part because of technical problems.

Role of Moderators

The role of moderators is also different in FTF and online focus groups. In FTF focus groups, the physical presence of a moderator leads to more control of the topic and lower possibility of getting off topic (Underhill & Olmsted, 2003). In FTF focus groups, the presence of dominant participants might prohibit other respondents from expressing their opinions and cause a disproportionate contribution of each member (Schneider et al., 2002). The presence of moderators in FTF focus groups helps avoid the dominance of a few participants when they tend to rule over the conversation (Underhill & Olmsted, 2003). For online focus groups, the moderator role is less intervening and less directive (Stewart & Williams, 2005). Turney and Pocknee (2005) found that the participants in online focus groups learned and observed what was happening in the focus group and this substituted for the role of FTF moderators. Literature points out that, with online focus groups, participants do not need to wait for others to finish their words nor will they cut off others' comments, which lessens the negative impact of dominant participants found in FTF focus groups (see Reid & Reid, 2005; Schneider et al., 2002; Walston & Lissitz, 2000). Stewart and Williams (2005) found that for synchronous online focus groups, however, the scripts and conversations are often more

complex and interweaving because participants can speak simultaneously. Therefore, they concluded that moderators in online focus group require the skills of not only conventional moderators but also competence in the technology that is used for the focus group in order to organize chaotic discussions. Nevertheless, online focus groups also make it possible for participants to track back the running transcript whenever they wish to (Schneider et al., 2002).

Participant-Related Factors

In addition to those basic logistical factors, the type of participants and participation trade-offs between online and FTF focus groups has been noted in the literature. For example, even if many dropouts result from the nature of the web environment, more diverse or samples from minority populations can be recruited easily (Birbaum, 2004; Rhodes, Bowie, & Hergenrather, 2003). On the other hand, online focus group participants can sometimes be unrepresentative of the whole population because only online users can access them (Walston & Lissitz, 2000). Participants who are unwilling to take part in FTF focus groups might participate in online focus groups since they are not seen and anonymity is guaranteed (only when it is online text only). Because of this, especially for sensitive issues such as health- or sex-related topics, online focus groups have been shown to be a better facilitator of participation with such topics and lead to fewer socially desirable and dishonest responses from participants compared to FTF discussion (Tates et al., 2009). Ironically, even if the online focus group provides anonymity, its anonymity cannot be guaranteed without careful usage. When participants' IP address can be found, online data can be easily tracked and an individual's information about the topic can be revealed (Rhodes et al., 2003). This can be problematic especially when the topic is delicate.

Potential Influence of Computer-Mediated Communication on Participants' Behavior

In the case of online text-only focus groups, the most explicit influence of computer-mediated communication on participants' behavior is connected to anonymous typing. Visual anonymity lowers inhibition of participants (Hiltz, Johnson, & Turoff, 2006; Walther & Burgoon, 1992) and provides certain types of participants a more comfortable space to express their opinions. However, Martlew (1983) pointed out that the fundamental difference between speech and writing is that speech involves a highly motivating social context and is expected to be highly communicative. He considered writing a private activity that does not have to be immediately responsive. This leads to another fundamental difference: Without the advantage of immediate communication and reciprocal exchanges (as in FTF communication), writers have to be as unambiguous as possible to assign intended meaning to their texts. Likewise, Werry (1996) discussed several distinctive traits of online text-only mediums. He argued that first, online text-only mediums usually involved a tendency toward brevity, which may be caused by spatial limitation. Second, innovative paralinguistic or prosodic devices were developed by the online text-only participants to create the effect of intonation, rhythm, and vocal stress. Third, symbolic representation of different concepts (e.g., facial expression, hug, etc.) was generated to foster communication.

With respect to online audiovisual focus groups, the richer communication medium offered by the audiovisual information can affect participants differently because visual anonymity is reduced. Joinson (2001) found that self-disclosure level decreased with the presence of a video picture of the other person in communication. He argued that the foremost and obvious reason for this was that in an anonymous condition, such as in online text-only focus groups, participants tended to express themselves more. Another potential explanation is that public self-awareness and accountability concerns that were prone to generate social inhibition in online audiovisual focus groups play a marked role in keeping a participant from his or her self-presentation.

Qualitative Data Quality and Richness

In past qualitative research, data quality has been examined under different names such as “quality” (Stenbacka, 2001), “validity” (Whittemore, Chase, & Mandle, 2001), “reliability” (LeCompte & Goetz, 1982), “objectivity” (Kirk & Miller, 1986), and “richness” (Ogden & Cornwell, 2010). The definitions of those concepts overlap with but also differ from each other. Nonetheless, they ultimately represent the quality of the qualitative data. After a comprehensive literature review, we propose that data quality has two major dimensions: data objectivity and data richness. Those two dimensions differ in definition, property, measurement, and means of realization.

Data Objectivity

Objectivity is the ability for an empirical method to survive falsification (Popper, 1959). Objectivity in qualitative research is not to objectify the subject matter through overmeasurement or to search for absolute “truth” (Etzioni, 1964) but to be humbly reflexive of the qualitative data and to critically search for alternative views (Kirk & Miller, 1986). They claimed that objectivity is realized through maximizing reliability and validity of the methods used. Similar concepts are “trustworthiness” (Lincoln & Guba, 1985) and “rigor” (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Reliability is defined as the ability of a qualitative measure to yield the same answer no matter when or how it is operated (Kirk & Miller, 1986). Validity is broadly defined as “the state or quality of being sound, just, and well-founded” (Random House Webster’s Unabridged Dictionary, 1999). Kirk and Miller (1986) defined validity as the extent to which a particular qualitative method gives a correct answer. Whittemore, Chase, and Mandle (2001) synthesized past research on different criteria of data quality and categorized validity into primary and secondary criteria. Credibility, authenticity, criticality, and integrity are considered primary criteria; whereas explicitness, vividness, creativity, thoroughness, congruence, and sensitivity are secondary criteria. The primary criteria are necessary for all qualitative methods. Credibility and authenticity refer to accurate interpretation of data. Criticality and integrity refer to disambiguation and clarification of what the data really suggest and maintenance of consistency throughout data collection and analysis. The secondary criteria emphasize the quality of qualitative data. Explicitness refers to the ability for qualitative inquiries to be audited and defended. Vividness involves artful, imaginative, and clear description of data, which focuses on the salient features of themes. Creativity refers to the novelty of methodological designs. Thoroughness is the depth of connections between themes and development of ideas. Congruence refers to logical, methodological, and theoretical consistency within qualitative inquiries. Sensitivity is the ability of qualitative inquiries to be sensitive to human nature and cultural/social contexts.

A fundamental difference between the primary and secondary criteria is whether the techniques that enhance those criteria can be implemented before or after data collection. The term “technique” was defined as “the methods employed to diminish identified validity threats” (Whittemore et al., 2001, p. 528). The techniques that meet the primary criteria are accurate and consistent interpretation of data, which happens after data collection. Differently, the techniques that help achieve many of the secondary criteria are prior to the onset of data collection (e.g., methodological design that places participants in more natural environment, such as online focus groups). Since the primary criteria for validity/objectivity emphasize the rigor in data interpretation, we proposed that data objectivity focuses more on extrinsic quality, which is extrinsic effort to enhance research quality without changing the data itself. However, the quality of the data itself is intrinsic and cannot be altered by data interpretation but can be enhanced through methodological designs that encourage equality of participation (i.e., balanced and equitable participation regardless of status and other social factors, Dubrovsky, Kiesler, & Sethna, 1991; McGuire, Kiesler, & Siegel, 1987) and self-disclosure (i.e., “act of revealing personal information to others,” Archer, 1980, p. 183).

Data Richness

Intrinsic data quality is often referred to as data richness (Harris & Huntington, 2001; Ogden & Cornwell, 2010). Compared with data objectivity, there is a lack of research on data richness and how it can be achieved. Charmaz (2003) defined data richness as the quality of “revealing participant’s thoughts, feelings, intentions, and actions as well as context and structures,” which affords “views of human experience that etiquette, social conventions and inaccessibility hide or minimize in ordinary discourse” (pp. 88–89). Much research has shown that different qualitative methods or methodological designs yield distinct richness of qualitative data. Duggleby (2005) suggested that focus groups generate more interaction data, which increases the depth of the inquiry and discloses otherwise less accessible aspects or opinions. Compared with data objectivity, our research is more interested in examining “data richness” or intrinsic data quality across focus group mediums since we believe that the richness of data can be very different under different methodological designs, given data are interpreted equally through the same methods.

There is a lack of clarification of and consensus on what criteria justify “rich data,” although abundant research has used the term “rich” (e.g., Ashworth, 2003; Breakwell, 2006; Coyle, 2007). According to Charmaz (2003), the data are rich when participants disclose true feelings as well as access the otherwise inaccessible thoughts. Kitzinger (1994) stated that argumentative interaction contributes to data richness of focus group. Lambert and Loisel (2008) implied in their research that rich data have a richer conceptualization of phenomena and better identification of the personal and contextual environment surrounding the phenomena. Dey (1993) suggested that richness of qualitative data lies in the variety of formats of representation (e.g., sounds, gestures, videos) and combination of those formats. Dey also pointed out that data richness is the range and relevance of ideas generated through qualitative inquiry. According to Dijkstra, van der Veen, and van der Zouwen (1985), revelation of personal information is an indicator of data richness. Therefore, data richness refers at least to three major aspects, which are depth, breadth, and relevance. Depth embraces interaction and connections between themes, concepts, and experiences (Lambert & Loisel, 2008). Breadth contains the range of topics or themes discussed (Dey, 1993) and the accessibility of information (Charmaz, 2003). Relevance is the adherence of the contents discussed to the ultimate goal of the research (Dey, 1993).

The operational definition of data richness is intrinsically quantitative. Ogden and Cornwell (2010) successfully operationalized data richness by examining the relationships between more complex variables that more directly reflect data richness (e.g., how personal or elaborative the responses are) and more easily examinable variables such as word counts and word usage. Significant correlations have been found between word counts/usage and the degree of openness, positivity, specificity, and personalization in responses. They therefore operationalized data richness in terms of five discrete dimensions based on various definitions and descriptors across the literature: length of response, emotional/descriptive expression, “the use of personal pronouns,” descriptions of action, and “expressions of insight and causation” (p. 1064). Ogden and Cornwell also tried to use factor analysis to group the five dimensions in a meaningful way. The analysis ended up grouping those dimensions into three factors (Factor 1: personal pronouns; Factor 2: emotional/descriptive expression and description of action; and Factor 3: length of response and expressions of insight/causation). Therefore, they concluded that the five dimensions were more meaningful when treated separately than as a group. Therefore, this study followed this recommendation. Ogden and Cornwell used different predictors to predict all five dimensions of data richness. Those predictors included personalization of topic, specificity of topics, positivity of topic, layman topic, health status, open-endedness of question, and reference to causation, and so on. They found that word count can be predicted by most predictors, especially positive themes, personal-related comments, openness of the questions, more specific knowledge on the topic, and so on. Therefore, word count is associated with richer information (more personal information and more specific knowledge and expert answers on the topic are positively associated with more total word counts).

Word Count and Data Richness

Although word count is not a direct measure of richness, its strong associations with the other variables that indicate richness (more personal response; response with more specific knowledge) make it a good indicator of data quality/richness. Besides Ogden and Cornwell's (2010) proposal, much research supports the importance of word counts as indicators of the diversity of patterns and perspectives in qualitative research. Pennebaker, Mehl, and Niederhoffer (2003) held that word usage patterns are "linguistic fingerprints" (p. 568) that reflect what people think. Leech and Onwuegbuzie (2007) argued that word count is most helpful in focus group research, because it is easy for identifying the level of participation of each respondent and what is important to those respondents. Word counts are not only closely associated with data richness, they can also be applied to enhance the rigor of qualitative research. Sechrest and Sidani (1995) pointed out that qualitative research usually uses vague terms such as "many," "most," or "several" to indicate the proportion of respondents with certain perspectives, which are quantitative in nature but are not well justified as valid interpretation of data. Sandelowski (2001) proposed that qualitative research needs word counts to justify those vague quantifiers and to avoid over- or underweighting of emergent themes.

Online and FTF focus groups have been shown to differ in the amount of data generated. Studies have found online text-only groups produce fewer words overall (Brüggen & Willems, 2009; Schneider et al., 2002) and fewer words per minute (Schneider et al., 2002). Others found that although the amount of communication is far less in online focus groups, the amount of ideas generated is almost identical to that in an FTF focus group (Reid & Reid, 2005; Underhill & Ogden, 2003). Furthermore, other studies showed online (text-only based) and FTF focus groups produce similar data in terms of quantity as measured by comments per minute (Schneider et al., 2002).

Although the research has tapped into the amount of data, it has not systematically explored differences between online and FTF focus group in terms of word count, word usage indicative of richness, and themes created. Moreover, no comparisons have been made between online audiovisual and online text-only focus groups in terms of these important variables.

Purpose and Research Questions

The literature comparing online and FTF focus groups currently does not address online audiovisual focus groups. Many of the data disadvantages found in online text-only focus groups could be eliminated or reduced with the use of online audiovisuals. As broadband Internet connections, online audiovisuals, and software capable of handling this medium become more commonplace, it may be a viable alternative to conduct certain types of focus groups where it would be cost prohibitive or limit the geographic diversity of participants to hold them FTF. Furthermore, this study addresses the lack of comparisons across the focus group mediums in terms of data richness.

The purpose of this study was to explore the similarities and differences in data richness between focus group delivery methods: FTF, online audiovisual, and online text only. The following research question guided the research: *What are the differences in data richness between the focus groups?* Data were compared on the following dimensions: (a) amount of topic-related data, (b) amount of unrelated data (no theme, socializing, medium related), (c) researcher ratings of data richness, and (d) word count and linguistic characteristics of data.

Methodology

Context and Participants

The evaluation of an agricultural and natural resources leadership extension program in Florida was the context in which this study was implemented. The program is an 18-month "class" for leaders in

agriculture and natural resources. An invitation to participate in the focus groups was sent to alumni from this program. If they accepted to participate, they completed a short survey to indicate their availability for participation; the survey included questions related to their ability to travel to attend an FTF focus group session and their access to required technologies (Internet, computer, online audiovisual) for the different online types of sessions. Based on those responses, participants were randomly selected and assigned (depending on their availability and technological capabilities) to a group. A total of 34 alumni participated in this study and ranged in age from about 27 to 65.

Every group had some participants who knew each other through interactions in the leadership program or in their work/industry. It is not uncommon to conduct focus groups that include participants who know one another in some capacity. This can occur primarily because having a homogenous group of participants within a focus group is a key element of the methodology (Krueger & Casey, 2009). Often times this means conducting focus groups with people who shared an experience (as in the case of this research), live in the same area, belong to a certain organization, or any other variety of grouping/selection criteria that would lead to a homogenous group. In this study, online audiovisual Focus group 1 had four who went through the leadership program together, online audiovisual Focus group 2 had two, online text-only Focus group 1 had two, online text-only Focus group 2 had three, FTF Focus group 1 had four, and FTF Focus group 2 had two.

The three different delivery modes for focus groups that were compared consisted of the traditional FTF focus group and two variations of online focus groups (i.e., online text only or online audiovisual). Two focus group sessions were held for each type of delivery. A total of six focus group sessions, with a length of 60–90 min each, were conducted with five to seven participants in each. The same moderator (who was not on the research team for this study) and same moderator's guide were used in all the focus group sessions. The moderator, a final-year doctoral candidate, was trained and experienced in focus group moderating and received additional training on using the technology and software for the online focus groups. The only variation in the moderator's guide across types of delivery was the section related to the instructions to participants, which were adapted to be specific to the context of the medium.

Data Analysis Procedures

Data for this study consisted of audio recording transcriptions (both from FTF and for online audiovisual focus groups) and text written by participants through the chat tool (both for online text-only and online audiovisual focus group sessions). Verbatim transcriptions of the audio recordings were made to prepare the data for analysis.

Data analysis consisted of two stages: (1) systematic content analysis and (2) software-based automated linguistic analysis.

Stage 1: Systematic content analysis. To compare the data richness across the mediums on the frequency of related and unrelated data, we did a systematic content analysis. It is "a method of studying and analyzing communication in a systematic, objective, and quantitative manner" (Wimmer & Dominick, 2013, p. 159). A codebook consisting of the descriptions of the topic-related and four other themes: agreement, no theme, socializing, and medium related, was developed. Topic-related themes were characterized by data relating to the participants' evaluations of the leadership program and their experience from it. "No theme" was characterized as data that was either off topic or not related to any of the themes. The agreement theme was described as statements of "I agree" or some form of it (e.g., ditto, yes, etc.) without elaborating any further. Schneider et al. (2002) also included this in their analysis and found these statements to be more prevalent in online text-only focus groups compared to FTF focus groups. Although these statements are technically still topic related, they are more so equivalent to nonverbal data (e.g., head nod) than providing anything more

substantial. We still wanted to code it because it was verbalized data, but we did not want those statements to artificially inflate the number of topic-related data that more thoroughly substantiated and evidenced those themes. Medium related referred to any passages referencing the medium. By our definition of the theme, it could have appeared in any of the focus groups, not just the online focus groups. If they were to appear in the FTF focus groups, they might have taken the form of talking about the room/environment or inability to hear or communicate with one another. Medium-related data were typically participants' expressions of uncertainty as to whether they could be heard or whether their connection was interrupted. Here is an example quote typical in this theme: "[Name of participant] if you're talking we can't hear you because your microphone is not on." The socializing theme referred to the participants conversing socially. Here is an example quote typical in this theme from a text-only group (grammar and capitalization not corrected): "Melissa and I found out a couple of weeks ago that our next baby is going to be a boy!! due in September."

Themes were systematically applied by two independent coders who were provided a codebook and trained. Both coders coded all of the data independently after training. Themes were applied to speakers as they took turns. In the transcripts, speakers were separated by line breaks so we termed our unit of analysis as paragraphs even though some only consisted of a few words. More than one theme could be applied to a paragraph. Intercoder reliability was analyzed using Krippendorff's α with the entire coded data set; it was $\alpha = .80$, indicating considerable agreement (Hayes & Krippendorff, 2007). Frequencies and percentages were averaged between the two coders to provide comparisons between the mediums on topic-related and unrelated data and descriptive statistics used to summarize the findings.

To compare data richness between the mediums, the codebook also defined the dimensions of data richness as described by Charmaz (2003), Kitzinger (1994), and Duggleby (2005; see literature review). The two independent coders rated each focus group's data in its entirety according to a richness score (1 = *low*, 2 = *moderate*, 3 = *high*) as judged by each coder to each transcript. This was done because spoken and typed language conventions in qualitative data may only be understood as more or less rich by the researcher (as opposed to computer software). Also, the researcher interprets the data in the context of the focus group discussion as a whole, which can influence perceptions of data richness. The coders were in perfect agreement on their ranking for each of the six focus groups.

Stage 2: Software-based automated linguistic analysis. Another way we analyzed data richness was based on the work of Ogden and Cornwell (2010). Their work successfully operationalized data richness in terms of five discrete dimensions: length of response, emotional/descriptive expression, "the use of personal pronouns," descriptions of action, and "expressions of insight and causation" (p. 1064). The five dimensions of data richness (adapted from Ogden & Cornwell, 2010, p. 1064) coded for in this study are further characterized below:

- Length: (consisting of word count only).
- Descriptive: this reflected the degree of emotion and description (affective processes such as "happy," "nervous," and "annoyed" and perceptual processes such as "see," "hear," and "touch").
- Personal: to reflect how personal the response was, whether it was first-, second-, or third-person (personal pronouns).
 - We included second- and third-person pronouns, because this study's data come from a group (vs. one-on-one interview) setting and the topic of the focus group related to their evaluations of a group experience.
- Analytical: this reflected the level of analysis in the response (insight such as "think" and "know" and causation such as "because" and "consider").

- Action: included to describe descriptions of behavior (common verbs and adverbs such as “walk,” “went,” and “quickly”).

Using Linguistic Inquiry and Word Count (LIWC2007 Version 1.12, Pennebaker, Booth, & Francis, 2007), we examined these five dimensions to further analyze data richness between the mediums. LIWC is an automated text analysis program that provides an assessment of the extent to which various types of language are used, such as emotion, pronouns (expression of the self and others), actions (verbs), and about 67 other types. The software permitted the coding of data on the five dimensions of data richness and quantified the occurrences of those dimensions so they could be compared across the mediums.

Findings

Topic-Related and Unrelated Data

Topic-related data. The first level of analysis examined and compared the number of passages marked with a topic-related theme and the agreement theme between the three mediums. All of the topic-related themes appeared in the data of all of the focus groups. The FTF focus groups produced the most topic-related data (85.89%), whereas the online audiovisual focus groups and online text-only focus groups produced fewer (Table 1). Online audiovisual focus groups produced about 25% less (60.92%) and online text-only focus groups produced about 21% less (64.65%). The agreement theme only present in the online focus groups (Table 1).

Topic unrelated data. Three topic unrelated themes were also systematically applied to determine differences between the mediums in the prevalence of participants' discussion unrelated or unsubstantial to the topic of the focus groups: no theme, socializing, and medium related. About 14% of the data in the FTF and online text-only focus groups and about 9.20% of the data in online audiovisual focus groups were coded as having no theme (Table 1). Online text-only focus groups had the most amount of socializing data (15.86%), followed by online audiovisual focus groups (10.00%), whereas FTF focus groups had none. For medium-related data, the online audiovisual focus groups contained the most passages (13.56%) followed by online text-only focus groups (2.25%). The FTF focus groups contained no mention of the FTF medium (Table 2).

Researcher Ratings of Data Richness

From the richness scores assigned by the independent coders to each focus group transcript, the FTF and online audiovisual focus groups were all rated as having high richness ($M = 3$, standard deviation [SD] = 0). The online text-only focus groups were both rated as having low richness ($M = 1$, $SD = 0$).

Word Count

Using LIWC, data were coded and analyzed on the five dimensions of data richness: length (word count), descriptive, personal, analytical, and action. The first level of analysis examined the total word count of each focus group medium. Word count was similar among the FTF focus groups (7,713 vs. 7,349), but there were greater differences among the two online audiovisual focus groups (9,992 vs. 6,765) and even more so among the two online text-only focus groups (3,560 vs. 6,323; Table 3). The difference between the online text-only groups may be attributable to the space available for typing. In online text-only 2, one of the participants informed the entire group that they could resize and make the online text-only text space larger, thereby providing a larger typing area

Table 2. Comparison of Types of Data Between the Mediums.

Medium	Total Average Paragraphs	Topic-Related N (% of total)	"I agree" N (% of total)	No Theme N (% of total)	Socializing N (% of total)	Medium-Related N (% of total)
FTF	124.00	106.5 (85.89)	0	17.5 (14.11)	0	0
Online AV	108.75	66.25 (60.92)	5.25 (4.83)	10 (9.2)	12.5 (11.49)	14.75 (13.56)
Online text only	165.5	107 (64.65)	6.50 (3.93)	23.5 (14.20)	26.25 (15.86)	2.25 (1.36)

Note. FTF = face to face; AV = audiovisual. Two focus groups per medium. Data averaged between two coders.

Table 3. Word Count Comparison Between Groups.

Focus Group	Word Count	Average Within Medium
FTF 1	7,713	7,531
FTF 2	7,349	
Online AV 1	9,992	8,379
Online AV 2	6,765	
Online text-only 1	3,560	5,163
Online text-only 2	6,323	

Note. FTF = face to face; AV = audiovisual.

and displaying more of the group's postings. This is both a limitation of the study and an implication that will be expanded on in the Discussion section.

The FTF ($M = 7,531$) and online audiovisual mediums ($M = 8,379$), on average, produced relatively similar word counts (10% more in online audiovisual), whereas the online text-only groups ($M = 5,163$) produced about 32% fewer words than the FTF groups and 39% fewer words than the online audiovisual groups (Table 3).

Linguistic Characteristics of Data Richness

Findings from the linguistic characteristics of richness (descriptive, personal, analytical, and action) showed that FTF (personal: 16.98%; action: 17.54%) and online audiovisual mediums (personal: 18.58%; action: 17.41%) had greater percentages of personal and action descriptors. The groups were fairly close on analytical descriptors (FTF: 4.83%; online text only: 4.20%; online audiovisual: 5.37%). Both online groups were similar in descriptive data and contained more of this data than FTF groups, while all three mediums produced a similar amount of analytical data (Table 4).

Discussion

Topic-Related Data

Contrary to previous studies (Reid & Reid, 2005; Schneider et al., 2002; Underhill & Olmsted, 2003), the online mediums did not produce as much topic-related data compared to the FTF medium. Underhill and Olmsted (2003) found that online focus groups could create as many topic-related data and unique themes as could FTF focus groups, despite having more topic unrelated data. We found that both online audiovisual and online text-only focus groups produced remarkably fewer topic-related data. However, it is worth noting that all of the topic-related themes appeared in all focus groups. This demonstrates that online mediums may be capable of generating as many ideas as the FTF medium but probably with less elaboration, which is in line with Schneider et al.'s (2002) findings. We also examined a unique

Table 4. Percentages of Four Dimensions of Data Richness Across the Groups.

	Online Text Only (%)	FTF (%)	Online AV (%)
Personal	13.45	16.98	18.58
Action	14.14	17.54	17.41
Descriptive	7.15	4.89	6.15
Analytical	4.20	4.83	5.37

Note. FTF = face to face; AV = audiovisual.

variable—the “I agree” statements—which had not been examined before. The “I agree” statements are an indicator of demonstration of issue stance similar to other group members in an explicit and verbal way. More “I agree” statements in online focus group medium may indicate the necessity for expression of issue stance with confinements in other nonverbal cues (e.g., facial expression, see Edmunds, 1999; Rezabek, 2000). Rezabek (2000) regarded lack of nonverbal communication a limitation for online focus group medium. However, we found that people might use alternative ways of showing nonverbal cues (e.g., “I agree” instead of head nodding) by explicitly expressing agreements on someone’s stance.

Topic Unrelated Data

The less topic-related data could have been due to the amount of time participants spent socializing in both online mediums and talking about the medium in the online audiovisual groups, which took away time to talk about the topic and likely distracted participants. Socializing and mentioning of focus group medium are two variables that have not been examined by past research (e.g., Schneider et al., 2002; Underhill & Olmsted, 2003). Both research analyzed topic unrelated comments without partitioning them into subcategories. However, diagnosing different types of distractions in different focus group mediums is important in that it helps specify the trade-offs between them.

Notably, the medium was a unique distraction in the online audiovisual focus groups. In this study, that partly seemed to stem from participants’ expressions of uncertainty as to whether they could be heard or whether their connection was interrupted. This may be an issue relating to participants’ unfamiliarity with the online audiovisual technology as well as the interface to facilitate the focus group. Arguably, using an interface that is more intuitive or used more frequently by participants should lead to fewer medium-related distractions. Also, the integration of online audiovisuals into devices is still relatively recent and adoption of their actual use for video conferencing over the web in real time is likely still quite low. As such communication becomes more common, particularly as tools like Skype and Google Hangout/Video become more prevalent for facilitating communication, the medium should be less of a distraction in focus groups facilitated using the technology (Galloway, 2011). The FTF focus groups contained no mentions of the medium.

The online text-only and online audiovisual groups included much more socializing data than FTF groups. In the online text-only groups, this is likely explained by the need to establish a social presence and personality that would be communicated otherwise through tone of voice, facial expressions, and body language (Gunawardena, 1995). Another supporting finding is more “I agree” statements in online text-only groups, which also indicates the need for participants to demonstrate their stance more clearly due to the confinement imposed by the computer medium. The two pieces of evidence jointly imply that limitations in modalities (e.g., online chat does not allow FTF communication and auditory input) when expressing information may lead to transformation of those unexpressed information into viable input. However, the discrepancy in socializing could also be attributed to the lack of social time that participants might normally take part in before and after a focus group conducted in an FTF setting. Also, as previous research has suggested (Schneider et al.,

2002; Underhill & Olmsted, 2003), the moderator may have less of a presence, and therefore, less control in an online setting, which would naturally lead to participants getting off topic.

Another interesting finding is that the no-theme data in online audiovisual focus group was lower than that in FTF and online text-only focus group. No research has explicitly examined and explained such differences; therefore, we offer a potential explanation for such difference. Since the audiovisual focus group best fostered one participant speaking at one time, the focus group was actually operated as a set of sequential “speeches” by participants (i.e., participants could speak at the same time, but the technology made it difficult to interpret what any one person was saying, so they resorted to careful turn taking). Compared to online text-only and FTF focus groups, which were operated at a more dynamic group level, online audiovisual focus groups operated at a more organized level limiting, to some extent, spontaneous contributions by participants. On one hand, the individual “speeches” were more oriented toward the topic; on the other hand, the confinement of webcam technology reduced the connectedness between interactions among individuals and hence the less overall theme-related data compared to FTF. Although they did interact with each other about the topic (more so than online text only as explained later), fewer ideas related to the topic were brought up as a result of this somewhat reduced interaction among participants.

Word Count

Word count is related to length, which Ogden and Cornwell (2010) argued to be related to data richness and is a part of data thoroughness in terms of depth. Looking solely at word count would suggest that online audiovisual and FTF groups generate richer data than online text-only groups. Since previous research has not looked at online audiovisual focus groups, this is a new finding to add to the literature. It aligns with Brügger and Willems (2009) finding that FTF groups generate more data than online text-only groups.

Linguistic Characteristics of Data Richness

On the dimension of descriptive expressions, it appears as though online focus groups may have potential to generate more descriptive data. This could be because it is a less rich medium through which participants feel less of a need to edit themselves based on the nonverbal reactions of others (Hiltz et al., 2006; Walther & Burgoon, 1992) or because, in the case of the text-only groups, they tend to use more descriptive expressions to communicate their intended meaning as is the case in many forms of writing (Martlew, 1983). While nonverbal feedback is available in an online audiovisual medium, the medium itself seems to somewhat reduce that feedback.

The online text-only groups produced less personal expression data compared to the other groups. Participants in the online text-only groups often did not type in complete sentences, which could have affected the richness calculations. For example, rather than typing “I agree,” a participant might have just typed “agreed,” which would eliminate the personal pronoun from the sentence. However, in qualitative research, the researcher (as the data analysis tool) may infer those meanings from communication and linguistic norms, thereby leading to rich data. Still, it is important to note that the data are less personal in the online text-only medium, which could be problematic for research that seeks to prime individual reflection and rich, personal experiences.

The online text-only groups also produced the least amount of action data. This is reflective of participants’ lack of elaboration and shorter responses as noted in the researchers’ ratings of data richness. Because they were less likely to expand on their responses as a result of the medium limitations and communication conventions in that space, it led to simple sentences and short phrases with fewer verbs.

Researchers' Ratings of Data Richness

Data richness also relates to the depth of meaning that can be abstracted. A lot of words (data) can ultimately communicate little; by the same token, a few words can communicate a lot. In qualitative research, the researcher is the data analysis "tool" (Lincoln & Guba, 1985) and as such can make a judgment of data richness. If purely focused on the research questions for the focus group, the qualitative researcher would likely ignore irrelevant data like that related to the medium or socializing. In doing so, they would focus on the discussion centered on the topic and look for indicators of richness that may only be picked up on by understanding language conventions and the discussion in its entirety. Our analysis concluded that FTF and online audiovisual yielded the same level of richness (high), whereas the online text-only data were low in richness. To expand, both coders noted that the online text-only group participants were more likely to make responses without much explanation or detail, and they responded to each other's comments less frequently. Here is a typical response to the moderator's question on the leadership program's weaknesses from the online text-only group: "That you could go through the program only once." It was more similar to a question and answer session between the moderator and participants than a group discussion. These groups did socialize more and perhaps this was because they were not interacting with each other as much about the topic of the focus groups, so socializing was one way to do that. In the online audiovisual and FTF groups, participants would often begin their contributions from another participant's comments/ideas (e.g., "Yeah, I'd agree with that too, [other participant's name]. I haven't obviously gone to the level you have gone, but I have exploited things from the program . . ."). This showed more interaction and argumentation among participants about the topic of the focus group. They also shared more details and stories to explain their ideas, which often led them to new ideas or spurred an idea for another participant. Given definitions of rich data in the literature, the data in the FTF and online audiovisual embodied that.

Limitations

This study, because it was descriptive in nature and did not control all variables, had inherent limitations that should be considered and addressed in future research. The number of focus groups per medium only allowed for descriptive statistical analysis, which provides insight and may suggest trends, but cannot offer as much certainty as inferential statistics. The context of these focus groups meant the participants may have felt a stronger kinship with each other through sharing a common and very specific experience (the leadership class/program). This could be viewed as a limitation as it might have led to more socializing; although, it is not unusual when using homogenous groups of participants. Much of the previous research comparing online and FTF groups were in the context of sensitive topics. They included health-related topics, disease and treatment methods, marriage, factors that may affect body image, and academic dishonesty (Campbell et al., 2001; Tates et al., 2009). When the topics are sensitive like these, the medium being used can also add to the sensitivity of the topics of focus groups, and it might elicit different results about which medium is better to use. In comparison, the context used in this study was not sensitive; therefore, the results might not have been much affected by the characteristics of mediums used and might show more objective comparisons.

Recommendations for Future Research

Besides improving on the limitations of this research, future studies may examine the role of participants' familiarity and self-efficacy of live online audiovisual communication in effects on data. In addition, examining the influence of participants being able to see themselves on screen in the online audiovisual focus group would be useful. Many software applications not only display the video feeds of the other participants but also show a video feed of each person to himself or

herself (similar to if each participant held a mirror to show his or her own face to himself or herself). This is done so that each participant knows that their face/body is in the viewfinder, but it allows him or her to see how others view him or her. This may affect self-disclosure and nonverbal expressions. Related to this, it would be beneficial to assess the effects of user interface customizability to determine whether different layouts or even simply the ability for the user to control it affect data quality.

Conclusion

This study compared richness of data generated in FTF, online audiovisual, and online text-only focus groups and found clear-cut differences. Results showed that FTF focus group as a traditional medium yielded the most topic-related data and least distractions (e.g., socializing and medium-related themes). Online audiovisual focus groups yielded the least percentage of topic-related paragraphs due to medium distractions and socializing but the average paragraphs were much longer. In addition, the richness of data generated in online audiovisual focus groups was similar to that produced in FTF focus groups. Online text-only focus groups yielded the most percentage of theme-less as well as socializing data, the least number of words, and less richness compared with FTF and online audiovisual focus groups.

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