

BRIEF REPORT

Coding Communication in Consultation:
Accurate, Reliable, and Efficient AnalysisCourtenay A. Barrett
Ingham Intermediate School District, Mason, MichiganDaniel S. Newman
University of CincinnatiPaul O. Lords
Humboldt County School District, Winnemucca, NevadaChelsea Ritter
University of CincinnatiJoseph M. Cottrell
Cache County School District, North Logan, Utah

Given the importance of consultation in school psychology practice, more research is needed to examine the types of interpersonal communication through which consultation is effective. This study revisited Erchul and Schulte (1990), which investigated the amount of transcription and coding of consultation sessions required for reliable and accurate estimates of particular consultation communication variables. Using Linguistic Inquiry and Word Count, this study examined tone, interrogatives, clout, affect, and use of the 1st-person plural pronoun within the instructional consultation, assessment, and teaming process. Results partially aligned with Erchul and Schulte in that tone, interrogatives, and clout could be reliably and accurately assessed by analyzing 1 complete consultation session or segments of 2 sessions. Affect and pronoun use could not be reliably and accurately measured by sampling segments of consultation sessions.

Impact and Implications

The study investigated the amount of transcription and coding required for reliable and accurate estimates of various dimensions of consultation communication. Some dimensions of consultation communication were reliably and accurately estimated by coding only one consultation session, yet other dimensions were not. The results can guide researchers in balancing accuracy, reliability, and efficiency in studying communication in school consultation.

Keywords: school consultation, sampling, communication, linguistic inquiry, word count

School consultation is a form of indirect service delivery in which a consultant, such as a school psychologist, provides support to another adult (e.g., a teacher consultee) in support of a student, group of students, or larger system. Consultation is con-

sidered a foundational competency for school psychology practice (National Association of School Psychologists, 2010), a preferred activity for school-based practitioners (Bahr et al., 2017), and crucial to ensure effective prevention and intervention efforts on behalf of students (Erchul & Sheridan, 2014).

The research base for school consultation is modest yet growing (Erchul & Sheridan, 2014), including research focused on interpersonal communication (Erchul, Grissom, Getty, & Bennett, 2014). Scholars have recently advocated for the importance of proliferating research examining the mechanisms through which consultation functions, including interpersonal dynamics (Erchul et al., 2014; Newman, McKenney, et al., 2017). However, barriers to examining the consultation process are described in the literature, including challenges with audio or video recording consultation sessions in authentic school settings, a large number of studies' using graduate students who may or may not be generalizable to in-service educators, the burden of transcribing communication

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Courtenay A. Barrett, Department of Data, Systems, and Analysis, Ingham Intermediate School District, Mason, Michigan; Daniel S. Newman, School of Human Services, University of Cincinnati; Paul O. Lords, Humboldt County School District, Winnemucca, Nevada; Chelsea Ritter, School of Human Services, University of Cincinnati; Joseph M. Cottrell, Cache County School District, North Logan, Utah.

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Correspondence concerning this article should be addressed to Courtenay A. Barrett, Department of Data, Systems, and Analysis, Ingham Intermediate School District, Mason, MI 48864. E-mail: cmorsi@inghamisd.org

in consultation sessions, and labor-intensive coding methods (Erchul & Schulte, 1990). Given these concerns, consultation researchers may be interested in examining whether it is possible to sample segments, rather than the entirety, of recordings for transcription and analysis to make inferences about the consultation process. In turn, this may facilitate the examination of a broader set of social mechanisms that impact the effectiveness of school consultation, such as social power (Erchul et al., 2014; French & Raven, 1959).

The purpose of this study was to revisit Erchul and Schulte (1990), which investigated the amount of coding required for reliable and accurate estimates of particular consultation communication variables. The present study conceptually replicated Erchul and Schulte's study by investigating accuracy and reliability of measures of consultation communication at various points in time and applied the same research design. However, the focus of this study is on consultation implemented through a process of instructional consultation, assessment, and teaming (ICAT; Gickling, Gravois, & Angell, 2016) rather than behavioral consultation (BC; Bergan, 1977) and applies novel dimensions of communication selected based on prior research (Newman, Guiney, & Barrett, 2015; Newman, Guiney, et al., 2017) and the ICAT theoretical framework.

Coding: How Much Is Enough?

Erchul and Schulte (1990) analyzed data from 10 consultant graduate students enrolled in a course focused on BC training, who worked with 10 professional teacher consultees. Analyses focused on the constructs of domineeringness (i.e., bids for control by one individual, regardless of whether those bids were accepted) and dominance (i.e., bids for control by one individual accepted by the other individual), constructs often investigated in the consultation communication research (see Erchul et al., 2014, for a summary). The authors investigated three types of BC problem-solving sessions: problem identification interviews (PII), problem analysis interviews (PAI), and problem evaluation interviews (PEI; Bergan, 1977) with a total of 12 sampling plans. In this context, sampling plans are methods of determining segments of transcripts that would be representative of the entire population of available transcripts. The sampling plans included the first 2, 4, and 8 min of (a) PII alone; (b) PII and PAI combined; (c) PII, PAI, and PEI combined, and (d) the entire PII, PAI, and PEI sessions.

Results indicated that both dominance and domineeringness, assessed through Rogers and Farace's (1975) relational communication coding system, could be reliably and accurately estimated by coding only a subset of consultation transcripts, with coding of the entire PII interview's being the most advantageous approach (Erchul & Schulte, 1990). Coding PII resulted in high reliability ($>.9$ for both dominance and domineeringness) and limited bias in the group mean. Focusing coding on one PII session reduces the total amount of required coding, is applicable to cases that closed prematurely, and can be integrated with other PII-focused research. Although the results were promising, Erchul and Schulte (1990) recommended that the study's methods be applied to research with other consultation models and communication variables, which is the purpose of this study.

Communication in Instructional Consultation

The findings by Erchul and Schulte (1990) are particularly useful for thinking about BC communication research. However, other consultation models arguably have different foci, particularly regarding communication in the consultation relationship. For example, consultants applying a consultee-centered consultation model "strategically apply communication skills . . . during the problem identification and problem analysis stages of consultation" (Newman & Ingraham, 2017, p. 5) to promote humble inquiry, collaborative problem solving, and a nonhierarchical relationship (Newman & Rosenfield, 2019). This may be different from communication described in other consultation models (see Schulte & Osborne, 2003, for an extensive discussion of these issues).

ICAT is a team-based system in schools steeped in the traditions of the instructional consultation model (Rosenfield, 1987; Rosenfield, Gravois, & Silva, 2014). Consistent with other consultation models focused on problem solving in schools (Kratichwill, Altschaeffl, & Bice-Urbach, 2014), ICAT includes problem identification—analysis, intervention design, implementation, and evaluation stages. Of note, BC is typically implemented such that each stage is completed within one consultation session, whereas in ICAT, the problem identification and analysis stages (PID/PA) are combined and occur over the course of several consultation sessions. ICAT also incorporates instructional assessment (IA), or a systematic process of using authentic curriculum materials to assess a student's instructional needs, which is implemented in between sessions within the PID/PA stages (see Gickling et al., 2016, for a full description). Engaging with IA may spur dyads to change their conceptualization of the student problem or the consultation process itself, which may have implications for the communication used during subsequent consultation sessions.

Although some scholars have written conceptually about the importance of communication in instructional consultation practice and training (e.g., Newman & Rosenfield, 2019), only a few studies have investigated communication in ICAT and related models. Benn, Jones, and Rosenfield (2008) found quantitative and qualitative differences in communication between novice and competent instructional consultants, with competent consultants asking more clarifying questions and using more collaborative, instructionally focused, ecological, and accurate verbalizations. More recently, in a series of descriptive studies using Linguistic and Inquiry Word Count (LIWC; Pennebaker, Booth, et al., 2015), Newman et al. (2015; Newman, Guiney, et al., 2017) found pronoun usage, affective language, and verb tense to be potentially meaningful communication variables in instructional consultation. LIWC, described in more depth later in this article, is a popular language-analysis approach applied in social psychology and communication research but had not been previously applied to K–12 settings.

Research Questions

This study examines the viability of several sampling approaches when researching communication in consultation and revisits Erchul and Schulte (1990): (a) How long do transcripts need to be to provide reliable estimates of LIWC scores? and (b) What's the most reliable sampling plan?

Method

Participants and Research Setting

Data included transcripts from 10 consultation dyads engaged in the ICAT consultation model in the 2012–2013 academic year. All participants were state-certified teachers in the secondary setting with little or no formal training in consultation ($N = 20$). Consultants were selected to participate in the ICAT training by their principal. As part of their ICAT training, consultants were assigned an online coach, to whom they sent audio recordings of consultation sessions. Informed consent was collected from both consultants and consultees prior to their consultations. Two consultants and two consultees were male; four consultants were specialists (e.g., special educators, English language learner teachers). Dyads worked in six schools, five of which were located in the Mountain West and the remaining school was in the Midwest. All of the consultation cases addressed the reading concerns of individual student clients, eight of whom were male.

The first session included a discussion of the referral concerns (PID/PA1); the second session occurred after the pair had conducted IAs with their students (PID/PA2). The average length of the sessions was 13 min 57 s ($SD = 8$ min 4 s) and ranged in length from 3 min 13 s to 28 min 8 s. The average number of words spoken within each session was 1,143.2 ($SD = 688.49$), with a range of 233–2,546 words. There was not a significant difference in the number of words spoken during PID/PA1 and PID/PA2, $t(19) = 1.47$, $p = .16$.

Procedure

Recordings of consultation sessions were transcribed by school psychology graduate students, checked by the first author, and then prepared for LIWC analysis according to guidelines provided by Pennebaker, Booth, Boyd, and Francis (2015). Transcripts were split into the first 2-min segment of PID/PA1 and PID/PA2, the first 4-min segment of PID/PA1 and PID/PA2, and the first 6-min segment of PID/PA1 and PID/PA2 to compare to the entirety of the two sessions. In other words, PID/PA1 and PID/PA2 were split into segments of identical length (i.e., 2, 4, and 6 min) and sampled from both sessions and then combined in the PID/PA1 + PID/PA2 conditions. This mirrors the methodology outlined by Erchul and Schulte (1990), although 6-min segments rather than 8-min segments were examined because five out of the 20 sessions were less than 8 min long.

Measures

Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth, et al., 2015) is a tool that computes the frequency with which words from 90 linguistic categories (e.g., articles, pronouns, emotion words) were used in a text sample to reflect individuals' social or psychological state (Pennebaker, Booth, et al., 2015). These frequency measures are reported as the percentage of words written or spoken within each category and are the basis of LIWC scores or scales (i.e., aggregate scores from similar conceptual dimensions). Means and standard deviations are then calculated for each of the LIWC categories from the sample. Interested readers are referred to Pennebaker, Boyd, Jordan, and Blackburn (2015) for additional details regarding the definitions and psychometrics

of LIWC categories, which are based on text samples across a range of mediums and over 80,000 speakers or writers.

Five LIWC categories were examined in this study: affect, tone, interrogatives, clout, and first-person plural pronouns, chosen because of their theoretical alignment with ICAT communication skills and prior research (e.g., Newman et al., 2015; Newman, Guiney, et al., 2017). *Affect* is a psychological process measure that includes 1,393 positive and negative emotion words, such as *love*, *nice*, *hurt*, and *nasty* ($\alpha = .57$). *Tone* measures the level and direction of emotional valence and is reported as a percentile rank based on standardized scores established through prior research, with higher scores indicating a more positive or upbeat style and lower scores indicating a sadder, more anxious, or hostile style (Cohn et al., 2004). In school consultation, affect and tone may be related to the speakers' emotion language use during the consultation session (Newman, Guiney, et al., 2017). *Interrogatives* is the aggregate of the frequency of 48 words used within the consultation session, such as *who*, *what*, *where*, *when*, and *how* ($\alpha = .57$) and may be related to the questions asked during consultation. *Clout* measures expertise and is reported as a percentile rank based on standardized scores, with higher numbers suggesting confidence and the perspective of high expertise and lower numbers suggesting a tentative or humble communication style. In school consultation, clout might be related to the hierarchical or nonhierarchical relationship between consultants and consultees (Newman, Jones, & Ritter, 2016). The *first-person plural pronoun* measure includes the frequency with which 12 words (e.g., *us*, *ours*) were used during the consultation session by each speaker and may be related to collaboration in the consultation relationship (Newman et al., 2015).

Data Analysis

Preliminary analyses found no significant differences in the means for each LIWC category between PID/PA1 and PID/PA2 for clout, $t(19) = -.70$, $p = .49$; interrogatives, $t(19) = .27$, $p = .79$; positive emotion, $t(19) = .70$, $p = .49$; or negative emotion, $t(19) = .65$, $p = .53$. As such, time samples were evaluated based on their bivariate correlation and accuracy (i.e., estimates within 1 *SEM*) with the overall mean calculated across both sessions within each LIWC category, as outlined by Erchul and Schulte (1990). When the sessions were shorter than the time specified in the sampling plan or when one of the participants did not speak at all during the segment, the case was excluded.

Results

Table 1 presents the correlations between LIWC scores from each of the sampling plans and the LIWC scores from all of the transcribed communication. Correlations were evaluated against a criterion of .85 as an acceptable reliability coefficient (Erchul & Schulte, 1990; Lomax, 1982). Table 2 presents the means and standard deviations for each of the categories. The bias reflects the differences between the actual means and the estimated mean and was determined to be acceptable if they were within 1 *SEM*. The standard errors of the means were as follows: affect = .07, tone = 1.36, interrogatives = .05, clout = 1.38, and first-person plural pronouns = .09.

Results indicated that the following sampling plans met both criteria for each of the following measures: tone = entire PID/PA1, interrogatives = entire PID/PA1, and clout = first 4 min of PID/PA1 and the first 6 min of PID/PA1 + PID/PA2. No sampling plans met both criteria for affect and the use of first-person plural pronouns.

Table 1

Correlations Between LIWC Summary Scores From Various Sampling Plans and All Verbalizations

| Sampling plan | <i>n</i> | Affect | Tone | Interrogatives | Clout | First-person plural |
|----------------------------------|----------|--------|-------|----------------|-------|---------------------|
| First 2 min of PID/PA1 | 20 | .12 | .31 | .53* | .80** | .55* |
| First 4 min of PID/PA1 | 16 | .27 | .69** | .50 | .91** | .48 |
| First 6 min of PID/PA1 | 16 | .25 | .73** | .62* | .90** | .58* |
| Entire PID/PA1 | 20 | .79** | .90** | .93** | .93** | .76** |
| First 2 min of PID/PA1 + PID/PA2 | 20 | -.11 | .43 | .33 | .66** | .82** |
| First 4 min of PID/PA1 + PID/PA2 | 18 | .16 | .41 | .41 | .81** | .76** |
| First 6 min of PID/PA1 + PID/PA2 | 15 | .53* | .78** | .49 | .90** | .80** |
| Entire PID/PA2 | 20 | .62** | .80** | .59** | .90** | .91** |

Note. LIWC = Linguistic and Inquiry Word Count; PID = problem identification; PA = problem analysis.

* $p < .05$. ** $p < .01$.

Discussion

Consultation is a critical part of school psychology practice, yet a limited body of research has examined the role of interpersonal communication on the consultation process (Erchul et al., 2014; Erchul & Sheridan, 2014). Consultation researchers and practitioners have advocated for additional research to understand the social mechanisms for how consultation works but have also noted the challenges in conducting consultation research (Erchul et al., 2014; Newman, McKenney, et al., 2017). This study contributed to the literature by examining the accuracy and reliability of sampling plans for an expanded number of communication variables to facilitate future consultation research.

The results of the study are consistent in some ways with Erchul and Schulte's (1990) study. Two of the five dimensions could be reliably and accurately estimated by coding the first PID/PA session (i.e., tone, interrogatives). This aligns with Erchul and Schulte's finding that coding the entire PII session was most efficient and reliable. This is noteworthy because it (a) reduces the requirements for recording and transcription when examining these variables and (b) can be used in cases that close prematurely or before reaching later consultation stages, addressing two common challenges for consultation researchers.

Clout could be reliably and accurately measured by two sampling plans: the first 4 min of PID/PA1 and the first 6 min of PID/PA1 + PID/PA2. Therefore, it is possible that clout, or the hierarchical nature of the relationship, is established early in the

consultation process. Because both sampling plans had correlations over .90, and little bias when estimating the mean, using the first 4 min of PID/PA1 is recommended because it requires less transcription than does using the first 6 min of both PID/PA1 and PID/PA2. When examined in conjunction with tone and interrogatives, researchers could transcribe PID/PA1 but examine only the first 4 min of the session when examining clout.

No sampling plans reliably or accurately measured affect or the use of first-person plural pronouns. It is unclear whether this was due to the dynamic or unstable nature of these categories, a reflection of the common structure of consultation sessions where the consultant typically summarizes prior sessions and suggests an agenda for the current session, or both. In terms of affect, it is possible that this reflects the changing nature of emotion across interpersonal interactions or that affect becomes stable after the nature of the relationship becomes more established over time. Researchers are encouraged to use all available recordings and transcripts when examining variables related to affect and pronoun use.

Limitations and Future Research

Although this study has significant implications for conducting research on communication during school consultation, there are limitations that should be noted. First, results may not generalize to other consultation models, which may have different purposes for each consultation session, or to other communication variables. The variables presented herein may be a small subset of commu-

Table 2

Mean, Bias in the Mean, and Standard Deviations of LIWC Scores for Each Sampling Plan

| Sampling plan | Affect | | | Tone | | | Interrogatives | | | Clout | | | First-person plural | | |
|-----------------------------------|-------------------|------|-----------|--------------------|--------|-----------|-------------------|------|-----------|--------------------|-------|-----------|---------------------|------|-----------|
| | <i>M</i> | Bias | <i>SD</i> | <i>M</i> | Bias | <i>SD</i> | <i>M</i> | Bias | <i>SD</i> | <i>M</i> | Bias | <i>SD</i> | <i>M</i> | Bias | <i>SD</i> |
| All available transcripts | 4.28 | | .87 | 70.95 | | 17.21 | 2.34 | | .66 | 69.84 | | 17.40 | 2.26 | | 1.12 |
| First 2 min of PID/PA1 | 4.96 | .68 | 3.06 | 61.12 | -9.83 | 28.71 | 2.77 | .43 | 2.38 | 70.24 ^a | .40 | 25.27 | 2.31 ^a | .05 | 2.13 |
| First 4 min of PID/PA1 | 4.53 | .25 | 2.17 | 58.61 | -12.34 | 26.07 | 2.80 | .46 | 2.11 | 69.38 ^a | -.46 | 24.92 | 2.12 | -.14 | 1.74 |
| First 6 min of PID/PA1 | 4.76 | .48 | 2.75 | 58.14 | -12.81 | 25.56 | 2.84 | .50 | 1.86 | 71.47 | 1.63 | 21.56 | 1.74 | -.52 | 1.28 |
| Entire PID/PA1 | 4.55 | .27 | 1.26 | 71.05 ^a | .10 | 22.57 | 2.38 ^a | .04 | 1.02 | 67.61 | -2.23 | 19.96 | 1.80 | -.46 | 1.03 |
| First 2 min. of PID/PA1 + PID/PA2 | 4.30 ^a | .02 | 4.27 | 67.56 | -3.39 | 27.60 | 2.21 | -.13 | 1.70 | 67.88 | -1.96 | 26.30 | 2.49 | .23 | 2.11 |
| First 4 min. of PID/PA1 + PID/PA2 | 4.29 ^a | .01 | 1.71 | 70.57 ^a | -.38 | 21.43 | 2.30 ^a | -.04 | 1.33 | 74.56 | 4.72 | 16.77 | 2.63 | .37 | 1.64 |
| First 6 min. PID/PA1 + PID/PA2 | 3.86 | -.42 | 1.31 | 66.91 | -4.04 | 21.36 | 2.33 ^a | -.01 | 1.09 | 68.82 ^a | -1.02 | 18.97 | 2.42 | .16 | 1.74 |
| Entire PID/PA2 | 4.25 ^a | -.03 | 1.30 | 71.38 ^a | .43 | 17.91 | 2.31 ^a | -.03 | .57 | 72.45 | 2.61 | 17.56 | 2.82 | .56 | 1.64 |

Note. LIWC = Linguistic and Inquiry Word Count; PID = problem identification; PA = problem analysis.

^a Indicates that sample means were within one standard error of the mean of all available transcripts.

nication dimensions related to consultation that are useful to understand in terms of efficiency to study. Research efficiency should be considered in conjunction with construct validity to identify the most meaningful communication dimensions that mediate consultation outcomes. Second, this study examined a small sample of in-service teacher consultants, who may have had prior relationships with their teacher consultees and engaged in relationship building in a different manner from that with external consultants or graduate students. This might limit generalizability to other types of consultants, such as school psychologists, who have often been the focus of school consultation research. Although the sample size was small, the inclusion of in-service educators was a strength of the study, and the challenge of data collection from in-service consultants has been described in the literature (e.g., Erchul & Schulte, 1990).

In conclusion, this study attempted to revisit prior research by Erchul and Schulte (1990) to investigate how much of a consultation session should be coded for reliable and accurate estimates of communication dimensions. Although findings indicated some variables could be reliably and accurately assessed by analyzing one complete consultation session, or segments of two sessions, other variables could not be reliably and accurately measured by sampling segments of consultation sessions. Continued research in this area can help establish which communication dimensions are the most important to measure and how this can most efficiently be accomplished.

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