

Author Response

Individuals from Diverse Cultural and Ethnic Backgrounds May Perceive Graphic Symbols Differently: Response to Nigam

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The augmentative and alternative communication (AAC) literature includes little empirical data on cross-cultural research that can support current educational and clinical practices (Huer & Saenz 2002). One data-based study by Huer (2000) offered preliminary insight into perceptions of graphic symbols that may need to be addressed by researchers as well as service providers working with cross-cultural populations. Nigam challenged the results of the Huer (2000) study, and commented on the selection of lexical items and level of acculturation of the participants. Through this response, dialogue about the possible impact from culture on symbol research continues.

Huer (2000) asked the question, “Will adults from African-American, Chinese, European-American, and Mexican cultural/ethnic communities assign similar translucency ratings to symbols from the three target symbol sets?” (p. 181). Based on a split-plot 4 (Ethnicity, the between subjects factor) \times 3 (Symbol, the within-subjects factor) repeated measures analysis of variance, Huer reported significant main effects for Ethnicity, significant differences for Symbol set, and a non-significant Ethnicity \times Symbol set interaction. Based on her preliminary findings, Huer concluded, “... culture/ethnicity had an impact on the translucency ratings assigned to symbols in three graphic symbols sets by participants in four groups. It appears from these data that individuals with different language and life experiences do not perceive graphic symbols in the same manner” (p. 183). In addition, Huer

stated, “It is interesting to note the lack of an Ethnicity \times Symbol set interaction in the results, indicating a high degree of consistency across the ratings of the four participant groups” (p. 184). In summary, based on the significant main effects findings for ethnicity, Huer reported that ethnicity differences impacted perceptions of graphic symbols. She further reported the main effect finding that her participants’ ratings of the symbols were consistent; that is, “Overall, all four groups perceived PCS as the most translucent and Blissymbols as the least so” (p.183).

Nigam, however, objected to Huer’s discussion of her findings, and noted that, ‘Since the result, however, indicated that there is no interaction between ethnicity and symbol set, this conclusion is not based on the data’ (p. 2). In essence, Nigam seemed to suggest that Huer should not have interpreted the main effect, either at all or as she did, because an interaction seemed implied by his view of the research. To check on possible interpretations of Nigam’s assessment of the relationship between Huer’s research question and the required statistical results, several experts who helped initially in refining the Huer analyses were again consulted (see author note). Despite attempts to identify any required interaction effect from the problem question, it seemed apparent that the problem statement only asserted a main effect. Though a creative reinterpretation of syntax might find an interaction *implied* in the project’s design, no interaction effect was necessarily the object of the *explicit*

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research question. Perhaps a different choice of words or an improved writing style would have prevented this confusion (for which the author expresses regret), but a fair reading of the problem question as stated does not require finding an interaction effect, though one would have been interesting to observe. In this case, however, the status of past research is such that, in regard to an interaction, Huer did not explicitly expect one, did not predict one, but included a factorial design to permit identifying one if it were in the data. Nigam's suggestion that Huer made an interactional interpretation of the data seems an idiosyncratic view of phrasing, at best; it is an example of a straw man argument because it attacks a position that never was specifically advanced or claimed.

In Huer's research question, no requirement is established that levels of the symbol sets are meant to influence or interact with any ethnic differences. In his classic statement, Kerlinger (1986) put it in plain terms: "More precisely, interaction means that the operation or influence of one independent variable on a dependent variable depends on the level of another independent variable. ... In other words, interaction occurs when an independent variable has different effects on the dependent variable at different levels of another independent variable" (p. 230). In this first, preliminary study (Huer, 2000), there was no speculation on differential responses of ethnic groups to different levels or types of symbol sets. Huer explored a clear main effect and found it. Huer noted, "The primary goal of this preliminary investigation was to examine the impact of culture/ethnicity on participants' perceptions of graphic symbols" (p. 180). Huer did not predict whether or not the results would reflect the differential sorts of ratings among specific categories of symbol sets. This inquiry, along with any possible interaction effect, was left open and was not made the object of an explicit prediction. Given that there are reasonable latitudes of choice that may guide scholars to examine data with slightly different preferences, the summary of the data provided in Huer (2000) appears to be accurate.

Secondly, Nigam stated, "The level of acculturation of the participants should not be ignored, particularly when the participants are first-generation immigrants, as in the Huer (2000) study" (p. 2). The study of culturally diverse populations involves special concern about a variety of cultural issues (Huer & Saenz, in press). The task of gathering data that are accurate, valid, reliable, and relevant, as required in research, is especially challenging when working with ethnically diverse groups (Bevan-Brown,

2001). Therefore, Nigam's concerns highlighted difficulties that must be faced in nearly all studies in the field that deal with true intercultural samples. Nigam's critique underscored an issue that is not unique to this study, but is a matter that many others in the field also should consider as they design their own inquiries. In the Huer (2000) study, the various criteria for participant selection were carefully considered. The level of acculturation of the participants was not ignored. For example, while focusing on the two immigrant populations included within the investigation, it was determined to be most necessary to focus on the 'language skills' of those participants within each group, because the experimental task required reading. Therefore, Huer (2000) established selection criteria to control for and match probable life experiences and language dialects within members of each of the ethnic groups. Her research team discussed the potential for multiple languages and residences, as well as educational and literacy levels of the participants. The team concluded that each participant would be assigned to one of four cultural/ethnic groups, based on his or her dominant language. Because of an awareness of immigration patterns and changing educational standards in China, for example, 'The participants from Mainland China were also included if they had emigrated from China prior to 1950 (in this year, the simplified Chinese writing system, Ping Ying, was introduced by the Communist regime, so that persons educated after 1950 had different educational experiences than those educated prior to that year)' (p. 181). Specific additional educational and language criteria were also established (Huer, 2000). Of course, it is important to consider the level of acculturation of participants when examining issues related to practices in AAC (Huer, Saenz, & Doan 2001). and Nigam's comments are a useful reminder.

Finally, Nigam suggested that, based on the results of the Huer (2000) study, a judgment about how individuals from diverse cultural and ethnic groups may perceive symbols, '... is premature and requires further investigation' (p. 2). He incorrectly stated that 'the 41-word corpus used by Huer (2000) as stimuli, had more verbs (26) than nouns (15)' (p. 3). In fact, the 41-word list included three word types: verbs (14), modifiers (12), and nouns (15). Although not yet published, there are also some preliminary results comparing the three word types; that is, word class by ethnicity (Huer, Cheng, & Li, 2002). Differing from the hypothesis by Nigam that 'The lexical items in the noun category might be more culturally sensitive than verbs' (p. 3), preliminary

evidence (Huer et al., 2002) appears to indicate that it may be the ‘verbs’ and ‘modifiers’, when graphically represented in the three symbol sets, which are more culturally sensitive than are the ‘nouns’. It seems reasonable to hypothesize that, as an artist moves towards capturing any given ‘abstract’ referent graphically, the more differences in participant perception will be observed. That is, as the depiction of a referent moves in a direction from a concrete representation (e.g., a noun or object) toward abstract representation (e.g., a verb or modifier), there is an increased likelihood that parameters pertaining to culture or ethnicity might be discovered. Indeed, Huer (2000) underscored Nigam’s concern that additional variables should be considered for their potential mediating influences in both the study methods and the suggestions for future research. As a matter of method, Huer reported a significant Mauchly’s test for symbols. This test analyzes the covariance matrix to determine if there is a significant deviation from sphericity (an assumption that requires that variances are equal and covariances are zero). Although researchers regularly examine this assumption, and make appropriate adjustments that prevent reporting results based on erroneous probability estimates (as did Huer), this test—as revealed by its identification of unequal variances and non-zero covariances—can also underscore the practical need to continue to search for additional moderating variables (such as those identified by Huer in her specific suggestions for future research [p. 184]). In particular, a significant Mauchly’s test (particularly in the absence of ceiling or floor effects in the data) is often taken as circumstantial evidence of the need to consider looking for additional explanatory variables to build into future studies (rather than letting them operate randomly). Given that the sphericity assumption was violated in this data set, this finding indicated that (in the absence of artifactual explanations, such as ceiling or floor effects), there must be other influences contributing systematic variation. This finding was reported in the study and made Huer’s suggestions for future research increasingly vital. As a matter of suggesting the importance of seeking additional variables as objects of attention in future research, Huer’s calls for such study were explicit: ‘Future analyses of the data from this study are expected to provide additional information about how symbols for referents in different word classes (i.e., nouns, verbs, modifiers) are perceived from a cross-cultural perspective’ (Huer, 2000, p. 184). Word class, as well as other variables, may become increasingly salient and are of interest for future inquiry. Huer’s as well as Nigam’s

suggestions for continued inquiries are important and should not be overlooked.

In summary, scholarly debate is necessary to more critically examine current presuppositions and to facilitate further exploration into new ideas. Nigam offered some interesting inquiries in response to Huer (2000), as well as valuable sources from the literature. No doubt, other academicians will ask additional questions as researchers continue to search for ‘cultural variables’ that may be present in the cross-cultural practices of AAC. While Huer (2000) attempted to report her preliminary findings clearly, it is apparent that there was the potential for readers to misread her summary. Therefore, this exchange serves to remind researchers that it is important to continually find alternatives to describe research findings, as well as to explore factors like interactions, as they pursue new lines of inquiry.

In the future, it seems reasonable to expect to see measures, other than those of translucency, through which to grasp a clearer understanding of the impact of culture on the perceptions of symbols. In Gattis (2002), for example, on structure mapping in spatial reasoning, there is an experiment on graphing with children. In this paper, she explored the process by which concepts are mapped onto space, and suggested that it may be the result of arbitrary conventions that must be culturally transmitted, or may be linked to non-arbitrary but cognitively constrained mappings. It would seem appropriate for researchers in AAC to learn more about such constructions of graphics and associations of meaning from a literature base such as that described in Gattis (2002). There are additional literatures that may prove useful to improving understanding of the perception of graphic symbols across cultures. One example is from scholars currently working in initial semantic representations in children: that is, when children learn the semantic structure of their native language (Tim Brackenbury, personal communication, 27 October, 2002). Such cross-linguistic comparisons of word representations may prove meaningful to furthering the field’s understanding of the use of graphic symbols within AAC.

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