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COMMENTARY

Performance on the Boston Naming Test in English-Spanish bilingual older adults: Some considerations

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Abstract

Gollan, Fennema-Notestine, Montoya, and Jernigan (this issue) present a timely and clinically relevant study that examines the impact of bilingualism on the performance on the Boston Naming Test in older adults. In light of the methodology employed, we weigh different potential interpretations of the findings and make recommendations for future studies. (*JINS*, 2007, *13*, 212–214.)

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Word finding difficulty is a frequent cognitive complaint among older adults. Among tests that assess confrontation naming, the Boston Naming Test (BNT, Kaplan et al., 1983) is arguably the most widely used naming test in the United States (US) and abroad. Approximately 47 million people in the US speak a language other than English at home, among which Spanish is the most spoken language (see Shin & Bruno, 2003). Given the high number of English-Spanish bilinguals in the US, the increase of cerebrovascular accidents and neurodegenerative diseases as we age, and the clinical utility of the assessment of naming abilities in the differential diagnosis of dementia (Diehl et al., 2005; Hodges et al., 1990), the study by Gollan and colleagues (this issue) on the association between bilingualism and BNT performance is timely and clinically relevant.

In their study, Gollan et al. (this issue) administered the BNT[a] to 29 older bilingual adults who rated their ability to speak English and Spanish as "fair" or better. The researchers administered the BNT first in the dominant language of the participants, according to their self-report, and then in their non-dominant language. In statistical analyses, the sample was divided into thirds based on BNT score differences when participants were tested in their self-reported dominant *versus* non-dominant language. The 10 subjects with the smaller English-Spanish score differences were called "balanced bilinguals" and those with the highest differences were called "unbalanced bilinguals." In addition to comparing the number of correct responses, based on different scoring methods, Gollan et al. compared the scores of a subset of items that were either English-Spanish cognates or noncognates. The primary findings in their study were (a) relative to unbalanced bilinguals, balanced bilinguals had lower BNT scores in their dominant language; (b) balanced but not unbalanced bilinguals obtained higher scores when points were accrued for correct responses in either language; and (c) balanced and unbalanced bilinguals obtained higher cognate scores in their non-dominant language, but only balanced bilinguals obtained higher scores for cognate items in their dominant language.

Other studies that have assessed the performance of English-Spanish bilinguals on the BNT when tested in both languages have used samples of young college students (see Kohnert et al., 1998), have stated that subjects were tested

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[a]Unless otherwise specified, the terms "BNT" and "standard BNT" in this commentary refer to the standard 60-item BNT version by Kaplan, Goodglass, and Weintraub (1983).

in both languages but did not provide information on results when tested in Spanish (see Roberts et al., 2002), or may have administered different versions of the BNT for each of the languages (see Rosselli et al., 2000). The study by Gollan et al. goes beyond previous investigations by focusing on the performance of cognitively normal bilingual English-Spanish older adults and by examining performance on cognate *versus* noncognate items. There are, however, some methodological aspects of the study by Gollan et al. that suggest that caution is needed in the interpretation of the observed findings. Some of these (e.g., small sample size and lack of counterbalancing in the order of English *vs*. Spanish administration of the BNT) are presented in the accompanying commentary by Bialystok and Craik (this issue) and will not be discussed here.

In our view, one of the more problematic methodological limitations in the study by Gollan et al. is that the relationship between balanced-unbalanced bilingualism is confounded by the language dominance of the participants. Specifically, 80% of the participants in the balanced and unbalanced groups are Spanish-dominant and English-dominant, respectively. There is also a question as to the Spanish proficiency of the English-dominant participants, especially in the unbalanced group. For example, Table 2 shows that subject #26 correctly named all 60 BNT items in English but only 9 items in Spanish, subject #18 named 55 items in English but only 15 in Spanish, and subject #4 named 57 items in English but only 19 in Spanish. Moreover, analyses of the data supplied in Table 2 indicate that, when tested in Spanish, the mean BNT score of the 14 English-dominant participants in the total sample was 27.14 ($SD = 10.3$) and the mean score of the 8 English-dominant participants in the unbalanced group was 23.00 ($SD = 8.0$). These low scores contrast with those of a recent study where the BNT was administered in Spanish to 89 cognitively normal Spanish-speaking older adults who reside in the US and who had comparable age (mean = 74.6 years, $SD = 4.7$) and educational attainment (mean = 11.9 years, $SD = 3.8$) as the sample in the study by Gollan et al. (see Acevedo et al., in press). Results in the Acevedo et al.'s study showed that the mean BNT score for older Spanish speakers tested in Spanish was 45.30 ($SD = 5.8$) and that 98% of the sample accrued a score of 32 or higher on the BNT. Although there is no universal agreement on the degree of proficiency that is needed in a language for an individual to be considered bilingual (Fabbro, 1999), the fact that English-dominant subjects in Gollan et al.'s unbalanced group would have scored in the lower 2nd percentile as compared to their primarily monolingual peers raises questions regarding the Spanish proficiency of the English-dominant unbalanced participants. In this regard, it is possible that the inability of the unbalanced group to benefit from the either-language scoring method may be explained by the low naming ability in Spanish of the English-dominant unbalanced participants.

To their credit, the authors attempted to address the issue of language dominance by separately analyzing data for English-dominant and Spanish-dominant participants in their entire sample. They contend that the negative correlations between total BNT scores and a measure of language balance (i.e., dominant minus non-dominant language score) indicate that balanced bilinguals benefited more than unbalanced bilinguals from the either-language scoring method. An equally plausible alternative, however, is that the ability to benefit from the either-language scoring method was not a function of balance as much as it was a function of proficiency in the non-dominant language. Furthermore, lower BNT scores in the dominant language of the balanced participants (80% of whom were Spanish-dominant) relative to the unbalanced participants (80% of whom were English-dominant) do not necessarily support the notion of a bilingual disadvantage among balanced bilinguals. What seems more compelling is that those classified as English-dominant had far less proficiency in their non-dominant language relative to those classified as Spanish-dominant.

In their study, Gollan et al. conducted analyses on cognate and noncognate items on the BNT. They stated that regarding difficulty for Spanish speakers, they matched cognates and noncognates based on percent correct responses in Spanish speakers in the study by Allegri et al. (1997), "excluding 5/22 of cognate items that were different in the Allegri et al. (1997) study version." The study by Allegri et al. (1997) was based on the official translation and adaptation of the BNT into Spanish (see Kaplan et al., 1996), where 12 of the 60 BNT drawings were substituted for 12 new stimuli that were deemed to be more culturally and linguistically appropriate for use with Spanish speakers. The basis for the matching of cognates and noncognates by Gollan et al. is somewhat difficult to understand because it seems that 8 of the 22 noncognates but none of the cognates used in their analyses are among the 12 items excluded from the official Spanish BNT (and thus from the study by Allegri et al., 1997). As an example, Gollan et al included "wreath" as a noncognate, but in actuality, in the official Spanish BNT, the word "corona" does not refer to a "wreath" but to a crown, named "corona" in Spanish. Because it seems that 36% of the noncognates but none of the cognates used by Gollan et al. were among the items eliminated from the official Spanish BNT because of possible bias, that the matching for item difficulty based on the study by Allegri et al. (1997) may not correspond to the actual stimuli presented by Gollan et al., and that 80% of subjects in the balanced group was Spanish-dominant, it might be prudent to consider the cognate effects reported by Gollan et al. tentative, pending replication.

To fully understand the implications of the study by Gollan et al. it would have been helpful to know the age and context of acquisition of English and Spanish among their participants, the country of origin of the balanced *versus* unbalanced participants, whether participants educated in other countries completed any of their schooling in the US and if so, at what academic level (e.g., elementary school *vs*. college). This is important, because the names of BNT items that are more likely to be learned at school rather than

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from everyday experiences (e.g., beaver, scroll), may be more commonly learned in American elementary schools (i.e., in English) than in elementary schools of Latin American countries (i.e., in Spanish).

In a study of bilingualism, it is tempting to ascribe BNT performance to solely linguistic factors. However, even variables that affect performance on naming tasks and that are sometimes conceptualized as language-specific (e.g., age of acquisition, word frequency), may not be devoid of cultural influences. Because cultural and linguistic influences are inextricably intertwined in the BNT, efforts to translate and adapt the BNT to other countries and/or languages have resulted in the elimination (see Pontón et al., 1996; Salmon et al., 1995), substitution (Kaplan et al., 1996; Kim & Na, 1999; Worrall et al., 1995), and/or reordering of BNT items (see Pontón et al., 1996; Serrano et al., 2001). Although beyond the scope of the study by Gollan et al., the impact of ethno-cultural/linguistic variables on BNT performance needs to be elucidated in future studies.

In sum, the study by Gollan and coworkers addresses a timely and most important issue and raises intriguing possibilities. Future studies with English-Spanish bilinguals will likely be strengthened by the addition of monolingual English-speaking and Spanish-speaking groups, the use of performance-based criteria and/or procedures to verify self-reports of competence in both languages, a detailed description of the ethno-cultural/linguistic characteristics of the sample, and the selection of noncognate items that are common to both the standard BNT and the official Spanish BNT. Clearly, there is a need in neuropsychology to develop better methods of determining the extent to which bilingualism, country and language of origin, and time spent in particular cultural, educational, and language milieus affect cognitive test performance. Given the extensive literature that suggests that "the bilingual is not two monolinguals in one person" (Grosjean, 1989, p. 3), the study by Gollan and colleagues represents a step forward in our understanding of the impact of bilingualism on neuropsychological test performance.

REFERENCES

Acevedo, A., Loewenstein, D.A., Agrón, A., & Duara, R. (in press). Influence of socio-demographic variables on neuropsychological test performance in the Spanish-speaking older adult. *Journal of Clinical and Experimental Neuropsychology*.

Allegri, R.F., Mangone, C.A., Fernández Villavicencio, A., Rymberg, S., Taragano, F.E., & Baumann, D. (1997). Spanish Boston Naming Test Norms. *The Clinical Neuropsychologist*, *11*, 416–420.

Diehl, J., Monsch, A.U., Aebi, C., Wagenpfeil, S., Krapp, S., Grimmer, T., Seeley, W., Forstl, H., & Kurz, A. (2005). Frontotemporal dementia, semantic dementia, and Alzheimer's disease: The contribution of standard neuropsychological tests to differential diagnosis. *Journal of Geriatric Psychiatry and Neurology*, *18*, 39–44.

Fabbro, F. (1999). *The neurolinguistics of bilingualism: An introduction*. East Sussex, United Kingdom: Psychology Press.

Grosjean, F. (1989). Neurolinguists, beware! The bilingual is not two monolinguals in one person. *Brain and Language*, *36*, 3–15.

Hodges, J.R., Salmon, D.P., & Butters, N. (1990). Differential impairment of semantic and episodic memory in Alzheimer's and Huntington's diseases: A controlled prospective study. *Journal of Neurology, Neurosurgery, and Psychiatry*, *53*, 1089–1095.

Kaplan, E., Goodglass, H., & Weintraub, S. (1996). *Test de Vocabulario de Boston* [Boston Naming Test]. Madrid: Editorial Médica Panamericana.

Kaplan, E., Goodglass, H., & Weintraub, S. (1983). *The Boston Naming Test*. Philadelphia: Lea & Febiger.

Kim, H. & Na, D.L. (1999). Normative data on the Korean version of the Boston Naming Test. *Journal of Clinical and Experimental Neuropsychology*, *21*, 127–133.

Kohnert, K.J., Hernández, A.E., & Bates, E. (1998). Bilingual performance on the Boston Naming Test: Preliminary norms in Spanish and English. *Brain and Language*, *65*, 422–440.

Pontón, M.O., Satz, P., Herrera, L., Ortiz, F., Urrutia, C.P., Young, R., D'Elia, L.F., Furst, C.J., & Namerow, N. (1996). Normative data stratified by age and education for the Neuropsychological Screening Battery for Hispanics (NeSBHIS): Initial Report. *Journal of the International Neuropsychological Society*, *2*, 96–104.

Roberts, P.M., García, L.J., Desrochers, A., & Hernández, D. (2002). English performance of proficient bilingual adults on the Boston Naming Test. *Aphasiology*, *16*, 635–645.

Rosselli, M., Ardila, A., Araujo, K., Weekes, V.A., Caracciolo, V., Padilla, M., & Ostrosky-Solís, F. (2000). Verbal fluency and repetition skills in healthy older Spanish-English bilinguals. *Applied Neuropsychology*, *7*, 17–24.

Salmon, D.P., Jin, H., Zhang, M., Grant, I., & Yu, E. (1995). Neuropsychological assessment of Chinese elderly in the Shanghai Dementia Survey. *The Clinical Neuropsychologist*, *9*, 159–168.

Serrano, C., Allegri, R.F., Drake, M., Butman, J., Harris, P., Nagle, C., & Ranalli, C. (2001). Versión abreviada en español del test de denominación de Boston: Su utilidad en el diagnóstico diferencial de la enfermedad de Alzheimer. [An abbreviated version in Spanish of the Boston Naming Test: Its utility in the differential diagnosis of Alzheimer's disease.]. *Revista de Neurología*, *33*, 624–627.

Shin, H.B. & Bruno, R. (2003). *Language use and English-speaking ability: 2000* (U.S. Bureau of Census, Brief C2KBR-29). Washington, DC: US Government Printing Office.

Worrall, L.E., Yiu, E.M.L., Hickson, L.M.H., & Barnett, H.M. (1995). Normative data for the Boston Naming Test for Australian elderly. *Aphasiology*, *9*, 541–551.