Are we at a socio-political and scientific crisis?

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The last few decades have seen a mushrooming of research concerning whether there are cognitive advantages related to executive functions conferred by bilingualism; considerable research supports such an advantage (Bialystok, Craik, Green, & Gollan, 2009), but a rising tide challenges this position. Paap, Johnson, and Sawi (2015) have marshaled a wealth of arguments and evidence against a bilingual advantage, at least challenging a broad, across-the-board advantage. They raise important issues regarding publication biases, confounds (SES, immigrant status, etc.) in participant choices, analyses conducted, and an absence of convergent validity across studies.

Any endeavor to make sense of the sizable conflicting evidence on these issues should be applauded, as such work in the final analysis will bring us closer to the truth, the ultimate goal of any scientific endeavor. Our own data examining a wide range of ages of simultaneous and early L2 bilinguals in Wales (Gathercole et al., 2010, 2014; Clare et al., in press) have failed to find strong support for a bilingual advantage. But here I will focus on the considerable rancor that surrounds these issues in the academic community. There appear to be two main reasons for the heated debates—socio-political and scientific.

The socio-political overtones of these debates should not be underestimated. Historically, we have experienced major changes in the zeitgeist towards bilingualism in the last century, especially in the United States. In the colonial period, bilingualism was accepted and protected as key to preserving individuals’ rights to heritage (Fitzgerald, 1993); at the turn of the 20th century, growing nationalism pushed for a “melting pot” in which immigrants should learn English; bilingualism and use of non-English languages were viewed as intolerable (Fitzgerald, 1993). Concurrently, the development and use of intelligence tests revealed low test results when administered to (limited-proficiency English-speaking) immigrants; this was interpreted by some as showing that bilingualism “caused ... mental confusion” (Hakuta, 1986: 28). Toward the mid-20th century, attitudes became more mixed, with influential studies in Canada (Peal & Lambert, 1962) arguing that the performance of bilinguals from the same socio-economic, socio-cultural background as monolinguals met or exceeded that of monolinguals. These debates have not abated in the public and educational sectors. One unspoken issue is undoubtedly some concern over the possible reversal of the growing positive press regarding bilingualism that the research on executive functions has engendered.

The scientific issues are somewhat more intractable. The current scientific crisis entails a search for answers to difficult questions of how we choose the participants in these studies, what “counts” as evidence, how evidence should be collected and interpreted, and what we consider “publishable” research.

1. The last of these has been highlighted in recent discussions (de Bruin, Treccani, & Della Sala, 2015) and by Paap et al. (2015); the issue of publication bias is not unique to the present topic, and is worthy of serious re-evaluation by the scientific community in general.1

2. Second, and relevant to all studies of bilinguals: There is no way, ever, that one can perfectly match a monolingual group and a bilingual group on all measures (Baker, 2011). The ideal match in any experiment equates groups on cultural, socio-economic, intellectual, educational, linguistic, and experiential backgrounds. But, by definition, bilinguals speak and use two languages. Thus,

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1 To respond to such issues of publication bias, Cortex recently set up a new publishing initiative called Registered Reports (Chambers, 2013). Researchers can submit initial manuscripts outlining planned studies, including hypotheses, procedures, and planned analyses, prior to data collection. Acceptance, based on the scientific merit of the planned study, constitutes a guarantee of publication of the final paper, regardless of the results of the research.

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linguistically and experientially they can never be exactly matched with monolinguals (Hakuta, 1986). The difference is not only that the bilinguals are switching between two languages day in and day out, the key component linked with the executive function research of concern here. Just the fact that bilinguals know two languages makes them different—they have more words overall (two languages), they will not have the same range of lexical items in each language (“distributed characteristic”, Grosjean, 2010; Patterson & Pearson, 2004), there may be semantic and syntactic differences in their linguistic systems (Jarvis & Pavlenko, 2008), the two languages are “on line” at all times (Dijkstra & Van Heuven, 1998), there may be RT differences in accessing language (Soares & Grosjean, 1984), and fully fluent bilinguals may even have a special flair for language (Macnamara, 1966). Add to that that the bilingual populations under consideration often come from different backgrounds from the monolinguals (and from one another), and any comparison is fraught with interpretive difficulties, to say the least. It is a challenge of the deepest scientific nature.

3. How do we factor in task-specific effects and the interaction of multiple factors? We can never ignore the fact that any particular type of experimental procedure draws on its own set of linguistic and non-linguistic factors that can influence performance. [A classic lesson in this regard came from numerous studies in the 1970’s that proposed that children thought less meant “more”: Researchers eventually figured out that response patterns were largely due to non-linguistic strategies in responses, and had nothing to do with children thinking less meant “more” (Carey, 1978). Results often cannot be taken at face value. Add to this the fact that (a) bilinguals’ language proficiency grows out of a complex interaction of experiential and individualistic factors (Gathercole, in press), and (b) language and cognition interact in complex ways, and it is clear that the best explanations for performance is less than straightforward. This does not mean we cannot use such tests to investigate performance; we just need extreme caution in interpreting results—and triangulation, as Paap et al. (2015) point out.

4. How do we factor in baseline differences? As Paap et al. (2015) point out, the initial baselines demonstrated in the bilingual and monolingual groups may differ. Because there is no perfect match between bilingual and monolingual groups, these differences need to be taken into consideration. Some resolve this by focusing on difference scores, comparing baseline and target performance (e.g., congruent versus incongruent conditions). Still, baseline differences cannot be ignored and need to be adequately accounted for.

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