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DEBATE

A final reply to te Nijenhuis *et al.* (2019)

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Abstract
The effects of educational training are only one case of producing two groups (before and after) separated by IQ test performance on easier and harder items. The crux of the issue is whether we know that the causes between groups are genetic if they are differentiated by a Jensen effect and that the causes are environmental if they are differentiated by an anti-Jensen effect. A Jensen effect occurs when the two groups differ more as cognitive tasks become more complex. It is shown that genes vs environment must be diagnosed on a case-by-case basis, not in terms of whether a Jensen effect is present.

Keywords: Jensen effects; Neutral as to genes and environment; Real causes of IQ differences

Numerous causes, environmental as well as genetic, create IQ differences between groups. The crux of the issue is whether we know that they are genetic if the groups are differentiated by a Jensen effect and whether we know that they are environmental if the groups are differentiated by an anti-Jensen effect. A Jensen effect occurs when the two groups differ more as cognitive tasks become more complex.

It is now conceded that massive IQ gains from 1900 to almost 2000 had overwhelmingly environmental causes (Bratsberg & Rogeberg, 2018). Thus, when we compare 1900 people with 2000 people, we should find a huge anti-Jensen effect. Yet Jensen effects are neutral: gains on highly complex tasks are virtually the same as on easier tasks. Those who argue that Jensen effects diagnose genes vs environment have not, to my knowledge, ever faced up this anomaly.

The reason for this pattern is the peculiar mix of environmental factors at work. In 1900, people lacked the 'habits of mind' needed to do highly complex tasks like Ravens – they simply were not accustomed to manipulating symbols detached from the concrete world according to the rules of logic. As they developed that platform over the 20th century, this led to huge gains. Even in 1900 they had the 'habits of mind' needed for simpler tasks like rote memory. In sum, the asset of new habits of mind plus lower 'training gains' on the complex tasks just about equalled no asset of new habits of mind plus greater 'training gains' on the simpler tasks. Note that we would have been hopelessly confused if the illusion that environmental causes must create large anti-Jensen effects had clouded our minds.

I have used no sports analogies here. However, these raise the question as to whether the real world of cognition is a separate reality to be treated in isolation from all other aspects of reality in which human abilities rule. Basketball has played an important role in clarifying how environment can create massive gains in skills that are genetically influenced (have high *g* loadings and 'should' be impervious to environmental change). My view is that the psychology must integrate cognitive and non-cognitive skills in a cross-domain theoretical framework.

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Reference

Bratsberg B and Rogeberg O (2018) Flynn effect and its reversal are both environmentally caused. *Proceedings of the National Academy of Sciences of the USA* **115**(26), 6674–6678.

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