Intelligence 45 (2014) 122–123

Contents lists available at ScienceDirect

Intelligence

What does it mean to be an expert?

Jonathan Wai

Duke University, Talent Identification Program, 1121 West Main Street, Durham, NC 27701, United States

ARTICLE INFO

Article history:
Received 24 December 2013
Accepted 3 February 2014
Available online 4 March 2014

Keywords:
Cognitive ability
Expertise
Education
Methods
Science

ABSTRACT

Ericsson's (2014) response focuses on how his expert-performance framework is special, and how general population data cannot be used to address the topic of expertise development because of how special his expert performers are. He also critiques each of the papers in the special issue. Many of Ericsson's minor critiques of my work have already been addressed (see Wai, 2013, 2014). Therefore, I have focused this response to a handful of general themes: 1. The strengths of prospective and retrospective longitudinal data, 2. Disentangling cognitive ability and educational supports, 3. In the top 1%, more ability matters for expertise, 4. Broadening what it means to be an expert, and 5. In science, no specific theory or approach is special. Ericsson appears unable to go beyond his own framework and definitions to incorporate the approaches of others as well as the full network of evidence surrounding the development of expertise.

1. The strengths of prospective and retrospective longitudinal data

The eleven large samples of longitudinal data I presented—six prospective, five retrospective—were all focused on groups at the tails of the distributions. These are not samples from the "general population" and are precisely the populations relevant to the study of educational and occupational expertise and perhaps even Ericsson's "expert performers."

The strength of the analyses lies in multiple sources of data converging on a similar finding. Even within the top 1% of cognitive ability, people who were smarter at a younger age were more likely to end up as educational and occupational experts. And a large fraction of occupational experts were in the top 1% of ability at a younger age. Replications were demonstrated both prospectively and retrospectively. Ericsson's framework relies primarily on retrospective data. Given his definition of expertise is limited to only a handful of expert performers in the extreme right tail, he has both a sample size and restriction of range problem.

Ericsson (2014) reviews research that fits his perspective and notes, "These studies are particularly valuable as they test IQ in high school, rather than testing middle-aged scientists after they've made significant contributions to their field". IQ was tested in high school or before in the longitudinal data sources I used.

2. Disentangling cognitive ability and educational supports

Ericsson argues regarding SMPY, "If mathematically precocious students are offered additional course and support, how can we know if the resulting benefits are due to the offered support or their superior ability?". Assuming he is right about the additional support SMPY participants received, there is a simple test of this already in Wai (2014): look at the percentage of participants earning bachelor's, master's and doctorate's across SMPY (a select sample whose participants supposedly had additional educational support) and Project Talent (a random sample whose participants likely did not have any special educational support). The percentages across the two independent data sources, but same ability levels, are nearly identical (see Wai, 2014,

E-mail address: jon.wai@duke.edu.

http://dx.doi.org/10.1016/j.intell.2014.02.001
0160-2896/

Table 1), so this does not suggest that educational support received by the SMPY participants was likely the defining factor. This strongly suggests given the multiple sources of prospective and retrospective longitudinal data that intellectual ability is important.

3. In the top 1%, more ability matters for expertise

Ericsson writes: "Wai (2014) only reports that percentages of doctorates among the top quartile and bottom quartile of the top 1% in Project Talent differ significantly for mathematics ability but not general ability". Actually, I already noted that with all cohorts combined, the finding is significant for general ability and math ability.

He notes two sources looking at differences within the top 1% of general ability: Project Talent and SMPY. There were third and fourth sources as well (Wai, 2013, Table 3, p. 209). Even within billionaires and CEOs, more ability was associated with greater wealth and income. Therefore, the relationship between domain specific performance and general cognitive ability is not just "correlated for beginners".

4. Broadening what it means to be an expert

Ericsson describes occupational experts in my paper as "successful individuals" and "socially recognized experts". I would argue these groups should be considered experts. He argues that his expert performers are in a special category.

He notes, "Wai (2014) does not specify the nature of the reproducibly superior objective performance that his senators and billionaires are able to demonstrate in comparison to their peers". I am not sure why I have to specify what his framework requires in order for the groups I studied to be considered experts. A billionaire is someone in the top 0.0000001% of wealth, which is rare. It can be argued that they are objectively experts in making money. Likewise, senators, Fortune 500 CEOs, federal judges, and House members are experts in their professions. What this comes down to is different definitions of what it means to be an expert.

Dunnette (1966) described a classic game played by psychologists which he called "The Names We Love" (p. 344). In this game, "If facts appear that cannot be ignored, relabeling them or renaming them gives them their own special compartment so that they cease to infringe upon the privacy of the theory" (p. 345). I would encourage Ericsson to consider other broader definitions of expertise.

5. In science, no specific theory or approach is special

Ericsson writes, "Anybody interested in uncovering the structures mediating the highest levels of performance in domains of expertise, such as science, arts, games and *professions*, should consider the methods and theories offered by the expert performance framework and be prepared to make some exciting discoveries" (emphasis mine). First, he clearly discusses professions as areas of expertise, which are the groups discussed in my paper. Second, discoveries using his approach have already been made, and it is time to move beyond his approach to incorporate other approaches and the full network of evidence.

Unlike Ericsson who claims his expert-performance framework is "special" (title page), is "qualitatively different", and how he is "getting increasingly convinced" of the superiority of his approach, I do not think the approach taken in my paper (or other papers in this issue) is special or cannot be reconciled with others. I think my approach meshes well with Ericsson's own. It is surprising, therefore, that he claims "Any method, like the individual difference approach that requires large samples of individuals to identify general traits to account for individual performance *will never* be able to account for the very highest levels of performance—a level of performance attained by less than a handful of individuals" (emphasis mine). Ericsson's definition of an expert is so rare that his reliance on "individual cases and small samples" and resulting restriction of range likely precludes the individual difference approach to even be incorporated. My understanding of a scientist is someone who is not wedded to any particular theory, framework, or definitions but is interested in the full network of evidence surrounding a topic in order to uncover the truth. This is the approach I tried to take.

References

Dunnette, M. D. (1966). Fads, fashions, and folderol in psychology. *American Psychologist*, *21*, 343–352.

Ericsson, A. (2014). Why expert performance is special and cannot be extrapolated from studies of performance in the general population: A response to criticisms. *Intelligence* (For this issue, Acquiring expertise: Ability, practice, and other influences).

Wai, J. (2013). Investigating America's elite: Cognitive ability, education, and sex differences. *Intelligence*, *41*, 203–211.

Wai, J. (2014). Experts are born, then made: Combining prospective and retrospective longitudinal data shows that cognitive ability matters. *Intelligence* (For this issue, Acquiring expertise: Ability, practice, and other influences).