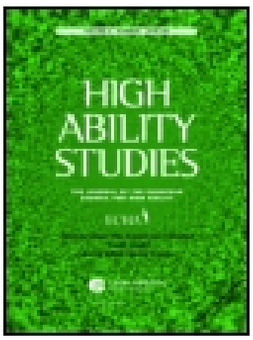

High Ability Studies

ISSN: 1359-8139 (Print) 1469-834X (Online) Journal homepage: https://www.tandfonline.com/loi/chas20

More confusion about deliberate practice: commentary on Miller et al. (2018)

David Z. Hambrick & Brooke N. Macnamara

To cite this article: David Z. Hambrick & Brooke N. Macnamara (2019): More confusion about deliberate practice: commentary on Miller et al. (2018), High Ability Studies, DOI: 10.1080/13598139.2019.1607723

To link to this article: https://doi.org/10.1080/13598139.2019.1607723

Published online: 23 Sep 2019.

HIGH ABILITY STUDIES
https://doi.org/10.1080/13598139.2019.1607723

Routledge
Taylor & Francis Group

More confusion about deliberate practice: commentary on Miller et al. (2018)

David Z. Hambrick[a] and Brooke N. Macnamara[b]

[a]Department of Psychology, Michigan State University, East Lansing, USA; [b]Department of Psychological Sciences, Case Western Reserve University, Cleveland, USA

KEYWORDS Deliberate practice; expertise

Twenty-five years ago, Ericsson, Krampe, and Tesch-Römer (1993) introduced the concept of *deliberate practice* (DP), arguing "individual differences in ultimate performance can largely be accounted for by differential amounts of past and current levels of practice" (p. 392). In a meta-analysis (Macnamara, Hambrick, & Oswald, 2014), we found DP did not explain even most of the individual differences in performance. We concluded DP is important, just not as important as Ericsson et al. argued.

In a *High Ability Studies* article, Miller and colleagues (Miller et al., 2018) claim that "although all 88 studies in Macnamara et al. (2014) were 'interpreted' by the researchers as DP, in reality, they were not" (p. 5). Miller et al. reanalyzed our dataset and report performance correlated more strongly with DP (.40; our correlation was .38) than with activities they deemed non-DP (.21).

We credit Miller et al. (2018) for their efforts. However, it is unclear what the criteria for DP were in their reanalysis. Furthermore, Miller et al. miss the mark on a critical methodological point. We discuss these problems in turn.

Ambiguities in methods

There is considerable confusion surrounding DP. In the accepted prepublication version of their article, Miller et al. (2018) stated: "we propose that in future studies, any activity deemed DP meet the following four criteria: (1) individualized learning objectives; (2) ongoing feedback regarding performance and learning; (3) involvement of a coach; and (4) successive refinement through repetition most often conducted alone (Ericsson & Lehmann, 1996). To this point, it is noteworthy that even work published by Ericsson, the researcher credited with originating the term, do not meet these four

CONTACT David Z. Hambrick hambric3@msu.edu Michigan State University

criteria and often change from one study or publication to another" (p. 13). This is a true statement. For example, Ericsson and colleagues have sometimes argued that a teacher is required to design DP activities (e.g., Ericsson & Lehmann, 1996; Ericsson & Pool, 2016), but other times argued that DP activities can be designed by teachers or the "performers themselves" (e.g., Ericsson, 1998, p. 84; Keith & Ericsson, 2007, p. 136). Surprisingly, at the page proofs stage, Miller et al. changed this critical point so that the published version of their article reads: "it is noteworthy that the definition of deliberate practice employed by Ericsson, the researcher credited with originating the term, has varied from one study or publication to another.... To that end, after reviewing the various definition [sic] available in the literature, any activity deemed DP meet the following four criteria [i.e., the criteria listed above]" (p. 7). This is a false statement. As noted, Ericsson has been inconsistent on whether a teacher is required to design DP activities, and numerous activities that have been deemed "deliberate practice" do not meet these four criteria (for examples, see Duffy, Baluch, & Ericsson, 2004; Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011). Miller et al. made this substantive change in their article with knowledge of our commentary, and without notifying either us or the Editor of *High Ability Studies*. (The accepted prepublication version of Miller et al.'s article is archived here: https://web.archive.org/web/*/https://www.scottdmiller.com/wp-content/uploads/2018/09/To-Be-or-Not-to-Be-An-Expert-FINAL-PREPRINT-COPY.pdf).

This disturbing matter aside, we used the definition of DP as "structured activities created specifically to improve performance in a domain" (Macnamara et al., 2014, p. 1608). This seems to capture the only unchanging definition of DP. Nevertheless, Miller et al. argue "a narrower definition of DP that more closely aligns with the principles of DP could have been used, and ... our reanalysis reports results when a narrower definition is used" (pp. 5-6). But what *is* that narrower definition?

Miller et al. (2018) had raters code each study in our dataset "using only the methods section" (p. 6) and claim "a study was coded as DP if and only if it explicitly indicated it estimated the effects of *deliberate practice*" (p. 6). However, in reality, numerous studies that were coded as DP do *not* explicitly indicate they estimated effects of DP. For example, Bilalić, McLeod, and Gobet (2007) was coded as DP, but Bilalić et al. state they did *not* interpret their practice measures as DP and do *not* mention DP in their methods. As another example, Weissensteiner, Abernathy, Farrow, and Müller (2008) was coded as DP, but Weissensteiner et al. state they measured engagement in "organized activities" *rather than* DP. These and numerous other studies met our broad definition of DP, but presumably did not meet Miller et al.'s narrower definition. All we know for certain is that, on some basis, 70 studies were coded as DP and 18 studies as non-

DP, and that all the latter were education studies, which in our meta-analysis had a weaker-than-average DP-performance correlation.

Thus, Miller et al.'s (2018) reanalysis does *not* show the practice-performance correlation is larger for studies that explicitly indicated estimating effects of DP than for studies that did not. It is unclear *what* their reanalysis shows. Miller et al. stress that criteria for DP should be "standardized, made explicit, accepted by researchers, and applied consistently" (p. 7). We agree – and hope Miller et al. can make explicit the criteria for coding studies as DP in their reanalysis. Until they do, their article will add to the confusion surrounding DP.

We note also that although Miller et al. (2018) state that "any activity deemed DP meet the following four criteria" (p. 7)–individualized learning objectives, coach involvement, ongoing feedback, and successive refinement–these criteria have rarely been used in past research to operationalize DP.

Confusing levels of analysis

Miller et al. (2018) explain that talent is a between-person effect, then state, "On the other hand, DP is a within-person effect: As individuals practice more, they will perform better" (p. 7). In fact, DP is a within-person effect in analyses of performance change of individuals, but a *between*-person effect in analyses of performance differences across individuals – as in Miller et al.'s reanalysis. DP improves people's performance, but the question a between-person analysis of the DP-performance relationship (e.g., Miller et al.) speaks to is whether people who accumulate similar amounts of DP should necessarily expect to reach similar levels of performance. The answer appears to be *no*. DP typically leaves large amounts of between-person performance variance (individual differences) unexplained, indicating people vary widely in how much DP they require to reach a given performance level. Assuming Miller et al. can clarify their methods, their findings bolster the case: DP accounted for 16% of the between-person performance variance.

Conclusion

The science of expertise can advance only through transparent scholarship. In this spirit, we made our dataset public (https://osf.io/rhfsk/) so others can reanalyze it. We hope Miller et al. (2018) can clarify their methods so implications of their reanalysis can be understood.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Bilalić, M., McLeod, P., & Gobet, F. (2007). Does chess need intelligence?—A study with young chess players. *Intelligence*, *35*, 457–470.

Duckworth, A. L., Kirby, T. A., Tsukayama, E., Berstein, H., & Ericsson, K. A. (2011). Deliberate practice spells success: why grittier competitors triumph at the national spelling bee. *Social Psychological and Personality Science*, *2*, 174–181.

Duffy, L. J., Baluch, B., & Ericsson, K. A. (2004). Dart performance as a function of facets of practice amongst professional and amateur men and women players. *International Journal of Sport Psychology*, *35*, 232–245.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, *100*, 363–406.

Ericsson, K. A., & Lehmann, A. C. (1996). Expert and exceptional performance: evidence of maximal adaptation to task constraints. *Annual Review of Psychology*, *47*, 273–305.

Ericsson, K. A. (1998). The scientific study of expert levels of performance: General implications for optimal learning and creativity. *High Ability Studies*, *9*, 75–100.

Ericsson, K. A, & Pool, R. (2016). *Peak: Secrets from the new science of expertise*. Boston: Houghton-Mifflin Harcourt.

Keith, N., & Ericsson, K. A. (2007). A deliberate practice account of typing proficiency in everyday typists. *Journal of Experimental Psychology: Applied, 13*, 135–145.

Macnamara, B. N., Hambrick, D. Z., & Oswald, F. L. (2014). Deliberate practice and performance in music, games, sports, education, and professions: A meta-analysis. *Psychological Science*, *25*, 1608–1618. **[See 2018 corrigendum]**.

Miller, S. D., Chow, D., Wampold, B. E., Hubble, M. A., Del Re, A. C., Maeschalck, C., & Bargmann, S. (2018). To be or not to be (an expert)? Revisiting the role of deliberate practice in improving performance. *High Ability Studies*.

Weissensteiner, J., Abernathy, B., Farrow, D., & Müller, S. (2008). The development of anticipation: A cross-sectional examination of the practice experiences contributing to skill in cricket batting. *Journal of Sport & Exercise Psychology*, *30*, 663–684.