

PROPOSING A THEORETICAL FRAMEWORK FOR STUDYING MATHEMATICAL EXCELLENCE

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The excellence phenomenon has been fascinating mankind since ever. In particular, excellence in mathematics is an intriguing thing – why some are capable of a math performance at excellent level, and some aren't? What do this very restrict group do differently from everyone else that sets them apart? What contextual variables, personal characteristics and math specific abilities need to be present to allow the potential to do math at top level? These are some of the questions that can arise in the researcher's mind when trying to unravel this phenomenon. But the very different factors involved and the connections among them may constitute a difficulty. This poster is proposing a theoretical framework that attempts to give consistency to this array of concepts and the links between them.

EXISTING MODELS

It's important to consider some existing theoretical models intended to the comprehension and development of talent and superior performance. Some models emphasize the natural abilities while associating some personal traits and contextual factors, while others privilege the importance of long deliberate practice and self-monitoring. Starting from the first group and gradually moving towards to the latter one, we consider the Theory of Multiples Intelligences (Gardner, 1993), the Triarchic Theory of Human Intelligence (Sternberg, 1985), the Three-Ring Conception of Giftedness (Renzulli, 1978), the Differentiated Model of Giftedness and Talent (Gagné, 1985), Ericsson's (2009) underline of the importance of Deliberate Practice, and lastly, the Role of Self-Regulatory Processes according to Zimmerman (2006).

OUR FRAMEWORK

Due to the diversity of views on excellence, we think it's worthy to build a framework that comprises the different beliefs. Therefore we suggest an umbrella framework, as seen in figure 1. There, it is clear the central role of motivation, as part of the needed general personality traits, as a couple together with talent that can lead to knowledge and also providing the necessary drive to engage in deliberate practice. We see the conjunction of abilities specific to mathematics and general personality traits as a potential to talent. We consider personal catalysts in the form of self-regulation and social catalysts as a response to the combination of talent and motivation.

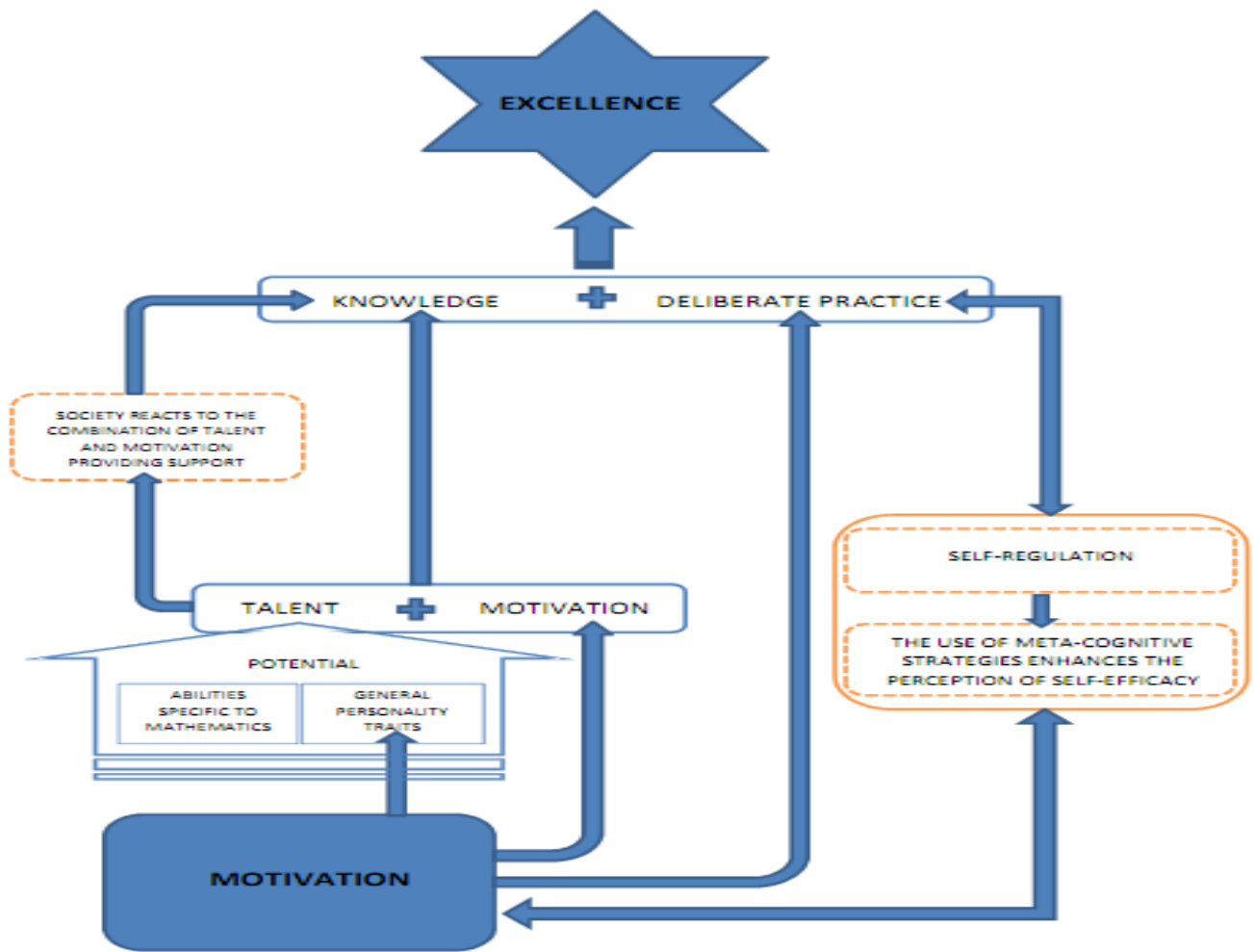


Figure 1: Purposed concept map of the concepts involved in math excellence

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