Book Review

From Beliefs to Dynamic Affect Systems in Mathematics Education: Exploring a Mosaic of Relationships and Interactions

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From Beliefs to Dynamic Affect Systems in Mathematics Education seeks to address an underlying problem flagged by Alan Schoenfeld in the book’s concluding article—“Research in the ‘affective domain’ is densely populated with overlapping constructs, partially commensurate methods, and somewhat contradictory findings” (p. 395)—by organizing, comparing, and contrasting the various theories, constructs, and research paradigms of affective research in mathematics education. The book’s 16 chapters are divided into three sections: “Theoretical Lenses in Affect Research”; “Relevance in the Field—Affective Systems of Individuals and ‘Collectives’”; and “Methodological Issues in Affect Research.”

Section 1 of the book begins by citing a taxonomy of affect that DeBellis and Golding (2006), expanding on the seminal work by McLeod (1992), identify as having four constructs: emotions, attitudes, beliefs, and values. Emotions are the taxonomy’s most malleable construct, while values are least malleable and therefore most difficult to change. This taxonomy presents an internal lens of affect, in which individuals develop their own affective system through interactions with their environment. Section 1 then explores other conceptions of affective development, considering affective beliefs through external lenses such as enactment, situatedness, culture, history, and context. In some cases, this plethora of differing views can be resolved but in others the views are incompatible.

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Section 2 of the book examines multiple studies of belief systems and their impact. Studies involved mathematically related affective beliefs of K to 12 students, university students, pre-service and in-service teachers, as well as gender differences in affective beliefs. These various studies reinforce the diverse theories of affect presented in Section 1.

The consideration of diverse theories continues in Section 3, emphasizing for example that culturally influenced views of mathematically related beliefs can have significant impacts on research designs as well as on data analysis and interpretation. Section 3 also explores other methodological issues, including the fact that almost all data in affective research are obtained through self-reporting methods such as Likert scale surveys and interviews. Issues considered in Section 3 include compatibility of data obtained through different methods as well as some newer methods of data integration such as networking theory. In addition, Section 3 discusses issues associated with self-reported data, such as social desirability bias (e.g., Van Yperen et al., 2014).

The book is strengthened by its organizational framework, which brings coherence to a very diverse field, as well as by the calibre of the authors, many of whom are well-known researchers in the field. Insightful commentaries by well-respected researchers such as Markku Hannula, David Clarke, Kenneth Ruthven, and Alan Schoenfeld are another of the book's assets. In addition, Hannula's metatheory of mathematics-related affect (p. 270) relating cognition, motivation, and emotion to physiological, psychological, and social dimensions provides a unifying framework for affective research in mathematics education.

The book's title may be a minor detraction, as readers may assume the book advocates moving away from the beliefs-as-objects view espoused by McLeod (1992), DeBellis and Golding (2006), and others to a more dynamic and interactive construction. This is not the case, as the book merely presents, by way of a single organizational paradigm, the various constructs and theories in the field. Still, while this book presents one organizational structure, it fails to recognize that this is not the only framework that could be used, and other organizations might offer different perspectives on the subject. This is an ongoing issue in mathematics-related affective research. As Di Martino and Zan (2015) note in their chapter on "The Construct of Attitude in Mathematics Education":

The theoretical debate about the quality of research about attitude persists. As a matter of fact, the need for comparing results from different studies and different theoretical frameworks is still a crucial issue, even when studies using questionnaires and statistical analysis have been replaced by qualitative case studies. New paradigms and new methods require the identification of new criteria for research quality: this is an important topic for future research in the affect field. (p. 68)

Overall, this book is a timely and useful addition to an area receiving greater attention in mathematics education lately, particularly as links between affective variables and student achievement have been explored in greater depth (e.g., Fredricks et al., 2004).

References

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