Teaching and learning disciplinary knowledge such as mathematics inevitably engages students in forming their identities (Wenger, 1998). When participating in classroom activities, students negotiate their self-perceptions and self-definitions vis-à-vis the norms, values, and competencies that are highlighted by the classroom pedagogy and discourse (Bishop, 2011; Cobb et al., 2009; Horn, 2008). Such negotiation involves forming a sense of oneself as being a certain type of person in the mathematics classroom (Gee, 2001), and has the potential to inform more stable self-perceptions regarding the domain of mathematics (e.g., “I like mathematics,” “I’m just not good at math”). This sense of self, in turn, frames students’ motivation for learning, level and type of participation in classroom activities, and achievement in mathematics. Unfortunately, too often, the negotiation and formation of students’ identities in the mathematics classroom is based in experiences of tension between who students perceive they are and who they perceive they are expected to be. As a result, many students view mathematics as irrelevant to their own present and future selves, perceive the subject as repetitious and senseless, or feel that they do not possess the “natural” talent for learning mathematics (Anderson, 2007; Boaler & Greeno, 2000; Blackwell, Trzesniewski, & Dweck, 2007). Despite the increasing research on students’ identities and identity formation in the mathematics classroom, relatively little has been suggested regarding how mathematics teachers may promote positive academic identities in relation to mathematics (Darragh, 2013). In the current chapter, we describe a conceptual pedagogical approach for promoting constructive identity formation within the mathematics curriculum by employing the mathematical concepts themselves as mediating tools for identity exploration.

PROMOTING IDENTITY EXPLORATION WITHIN THE SCHOOL CURRICULUM

Over the past decade, mathematics education researchers have been calling to foreground students’ identities in the mathematics classroom to understand the role of mathematics instruction in the formation of less and more desirable self-perceptions and attitudes regarding the subject (Boaler & Greeno, 2000;
Gresalfi, 2009). The research on identity in mathematics education has commonly adopted a sociocultural discursive perspective. Much of this literature focuses on the socialization of students into using mathematics concepts and procedures (e.g., “doing mathematics”) (Boaler & Greeno, 2000; Hand & Gresalfi, 2015; McCaslin, 2009) and on students’ negotiation of identities within a myriad of discourses that position them in various social-cultural roles (e.g., “good mathematics student,” “disabled,” “gifted,” “disruptive”) (Cobb et al., 2009; Hand & Gresalfi, 2015; Lee & Anderson, 2009). From this perspective, student agency in identity formation is exercised reactively as students resist, negotiate, or come to identify with normative academic roles. In the current chapter, we describe a complementary approach that emphasizes the promotion of students’ proactive, intentional, and reflective agency towards self-transformation of their mathematics student identities (Kaplan, Sinai, & Flum, 2014; Engeström, Sannino, & Virkkunen, 2014; Harrel-Levy & Kerpelman, 2010; Kegan, 1994; Schachter & Rich, 2009). The approach centers on a major mechanism of identity formation—identity exploration (Berzonsky & Adams, 1999; Grotevant, 1987; Kroger, 2004, 2007; Marcia, 1993).

Identity exploration is a “deliberate internal or external action of seeking and processing information in relation to the self” (Flum & Kaplan, 2006, p. 100). Broadly, identity exploration refers to experimenting with social roles and self-perceptions, questioning previously held identifications, values, goals, and convictions about the self, and seeking information about oneself and one’s environment. In addition, identity exploration involves processing such self-relevant information in ways that synthesize old and new self-understandings into an emerging sense of who one is and who one wants to become (Erikson, 1968; Kroger, 2007; Marcia, 1993). Such engagement in exploring and self-constructing identity has been associated with several positive indicators of well-being such as high and stable self-esteem, openness to experience and intellectual curiosity, a sense of autonomy and agency, tolerance of others, problem-oriented coping skills, and low test anxiety (Berzonsky, 1989; Berzonsky & Sullivan, 1992; Berzonsky, Macek, & Nurmi, 2003).

Identity exploration takes place primarily through personal and social dialogues within socio-cultural contexts, and is guided by social-cultural norms, beliefs, and concepts (Gee, 2001; Holland & Lachicotte, 2007; Penuel & Wertsch, 1995; Sfard & Prusak, 2005). In educational settings, identity exploration can and does involve the use of concepts, ideas, and experiences relating to academic content and activities (Kaplan et al., 2014; Sinai, Kaplan, & Flum, 2012). Moreover, engagement in identity exploration in educational settings shares much with adaptive academic motivation (Flum & Kaplan, 2006; Kaplan & Flum, 2010). By definition, identity exploration is intentional and self-directed, and is therefore characterized by agency and autonomous or self-determined engagement (LaGuardia, 2009; Luyckx, Vansteenkiste, Goossens, & Duriez, 2009). Moreover, when centered on academic content, identity exploration involves seeking to understand course concepts as they relate to the self, and hence shares characteristics with mastery goals—the engagement in the academic task with the purpose of learning and understanding