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ABSTRACT

Personal relevance goes by many names in the motivation literature, stemming from a number of theoretical frameworks. Currently these lines of research are being conducted in parallel with little synthesis across them, perhaps because there is no unifying definition of the relevance construct within which this research can be situated. In this paper we propose a new framework to synthesize existing research on relevance and provide a common platform for researchers to communicate and collaborate. In light of this new framework we review the role of relevance in three prominent theories in the motivation literature: the four-phase model of interest development, expectancy-value theory, and self-determination theory. We then explore eight relevance constructs commonly used in the literature and the educational interventions that derive from them. Finally, we offer a synthesis of these constructs and suggest some directions for future research.

DEWEY WAS AMONG the first to formally recognize the potential of personal relevance (hereafter "relevance") to motivate students and energize learning, noting that "things indifferent or even repulsive in themselves often become of interest because of assuming relationships and connections of which we were previously unaware" (1913, p. 22). Since that time, motivation and education researchers have investigated the effects of relevance on educational outcomes within a number of theoretical frameworks (e.g., expectancy-value theory, goal congruity theory). The resulting body of research is large but disjointed. Many different interventions aim to increase perceptions of relevance, but theory-specific vocabulary (e.g., utility value, goal affordances) makes it difficult to see the connections among them. Furthermore, theory-specific mechanisms (e.g., subjective task value, goal congruity) make it difficult to know whether these interventions work through the same or different processes. Theoretical and practical issues result, such as jingle-jangle fallacies (i.e., using similar terms for different constructs and different terms for the same construct; Block, 1995).

We believe that relevance suffers from excessive face validity: well-known dictionary definitions (e.g., pertinence, applicability) stand in the way of a precise definition of relevance as a construct in motivation theory. Researchers often do not define or operationalize relevance in their studies. Furthermore, most researchers use the terminology of a single theory without consideration of relations to other theories or constructs. Therefore we believe that a new framework is necessary to synthesize existing research on relevance and provide a common platform for researchers to communicate and collaborate.

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Defining relevance

Based on our reading of the "relevant" literature, we propose the following definition of *relevance*: "a personally meaningful connection to the individual." The key to this simple definition is the concept of *personal meaningfulness*. First, relevance is personal. In contrast to the dictionary definition of relevance, which emphasizes objective levels of pertinence, relevance as a motivation construct is an individual's subjective perception of the degree to which a stimulus (an object, an activity, a topic) is connected (i.e., has some relation) to the individual personally. In addition, relevance is meaningful. In order for a stimulus to be relevant it must be meaningful (i.e., personally significant) to the individual.

Accordingly, we conceptualize relevance along a continuum of personal meaningfulness characterized by three types of relevance (see Figure 1). The least personally meaningful type of relevance is *personal association*, the perception that a stimulus (object, activity, topic) is connected to some other object or memory, and so forth, that is personally valued. For example, a student might find a reading assignment for English class to be relevant because the book is about rockets and the student remembers building baking soda rockets in science class. This type of relevance is indirect, because the stimulus (e.g., the reading assignment) is not perceived to be relevant in and of itself but rather through its association to something else (e.g., an experience, a memory). Second, *personal usefulness* is the perception that a stimulus can be used to fulfill an important personal goal. For example, another student might find the reading assignment for English class to be relevant because it has utility for developing reading skills. Finally, the most personally meaningful type of relevance is *identification*, the incorporation of the stimulus in the individual's identity. For example, a student might find the reading assignment for English class to be relevant because the student identifies as a bookworm and so working on reading assignments is an opportunity to confirm or exercise that identity. Importantly, identification is more than just seeing a connection between the stimulus (object, activity, topic) and one's identity; identification involves perceiving the stimulus to be *part of* one's identity.

These three types of relevance are not mutually exclusive. For example, a stimulus may be perceived as relevant due to a combination of personal association and personal usefulness. However, we divide the continuum into three regions to illustrate different ways that people can perceive a stimulus as relevant and to highlight the fact that some relevance perceptions are more personally meaningful than others. As the example above demonstrates, the same stimulus (the reading assignment) can elicit different types of relevance for different individuals. Moreover the same individual may perceive a stimulus to be more or less personally meaningful at different times, depending on the types of connections that are most salient. This means that relevance perceptions are malleable, making them an ideal target for intervention. Educators can promote perceived
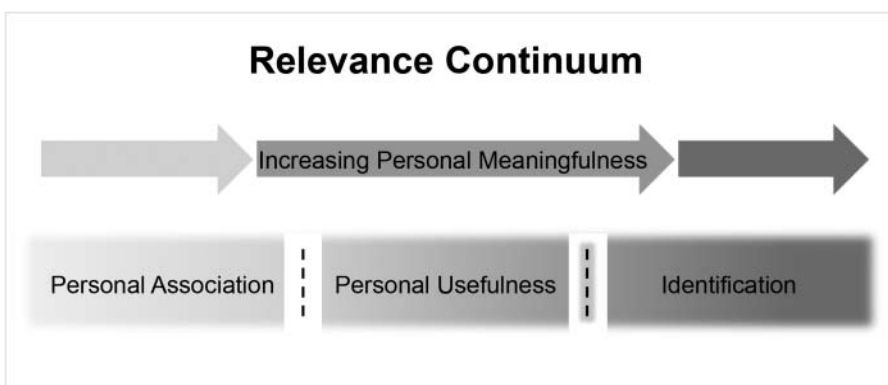

Figure 1. Relevance is a personally meaningful connection to the individual and can be conceptualized along a continuum of personal meaningfulness, ranging from personal association to identification.

relevance by helping students discover connections to the material or by making more-personally-meaningful types of relevance salient in the classroom, and the more personal meaning that students perceive, the more they will be motivated to engage with the content.

Our continuum provides a way of categorizing and quantifying different types of relevance—in terms of degree of personal meaningfulness—as well as a common vocabulary with which to talk about sets of constructs and interventions within each area of the continuum. We believe this continuum can provide a framework for synthesizing existing research, for resolving the various jingle-jangle fallacies currently plaguing the field, and for generating novel hypotheses for future work. Therefore, in this paper we use our relevance continuum as a broad framework to examine the role of relevance in three major theories in the motivation literature: the four-phase model of interest development (Hidi & Renninger, 2006), expectancy-value theory (Eccles et al., 1983), and self-determination theory (Deci & Ryan, 1985). We then explore a diverse range of approaches to relevance research, reviewing eight relevance constructs that receive considerable attention in the literature and the educational interventions that derive from them. Finally, we offer a synthesis of these constructs and directions for future research.

The four-phase model of interest development

Hidi and Renninger (2006; Renninger & Hidi, 2016) define two types of interest—situational and individual. *Situational interest* is a momentary increase in attention and affect in response to features of a stimulus or environment, which may or may not last over time. *Individual interest* is a predisposition to re-engage with a particular activity or topic over time. Hidi and Renninger have advanced a four-phase model of interest development that describes the processes by which an individual can move from momentary experiences of situational interest to a more enduring individual interest. It is important to note that the experience of situational interest can occur in any phase of interest development. However, it is only in later phases that interest becomes a trait-like disposition. Thus early phases of interest development are characterized by situational interest only, whereas later phases are characterized by individual interest as well.

Situational interest can be triggered (phase 1) by attention-grabbing features of the stimulus or environment, such as novelty or surprise, and can be maintained (phase 2) if focused attention is sustained by engaging with (i.e., spending time actively processing) or valuing the stimulus (Hidi & Renninger, 2006; Renninger & Hidi, 2016). For example, if a student enjoys working on vehicles, interest could be triggered during a history lecture about the use of Sherman tanks and U-boats in WWII and could be maintained by repeated mentions of war machines throughout the unit. If the individual increasingly enjoys engaging with, accumulates knowledge of, and comes to value the object of their interest, they will begin to seek out opportunities to reengage with it over time (emerging individual interest—phase 3). Finally, well-developed individual interest (phase 4) may develop if the interest becomes increasingly stable and self-sustaining. Environmental and stimulus features continue to trigger situational interest in any phase of interest development. However, as an individual's interest develops in later phases, it becomes more self-driven (e.g., the student seeks out more information), involves increasingly large stores of positive affect, knowledge, and value and becomes more generalized (e.g., from a lecture on WWII to U.S. history) and more central to the individual's identity.

Within the four-phase model, relevance serves primarily as a trigger for situational interest (Hidi & Renninger, 2006; Renninger & Hidi, 2016). Hidi and Renninger use the term *relevance* quite broadly, encompassing any of the three types of relevance on our continuum. Perceived relevance can trigger situational interest (i.e., increased attention and affect) in any phase of interest development, but it may do so differently in different phases. Personal associations (e.g., connections to existing interests, prior experiences, knowledge, etc.) may play a particularly important role in triggering situational interest in the early phases of interest development. However, as interest develops, relevance connections may become deeper and more content-specific, and the object of interest may be more closely associated with the individual's identity (Renninger, 2009). Thus the types of relevance that trigger situational interest for students with more-developed interest are likely to be more personally meaningful

(i.e., personal usefulness and identity), and these types of relevance may be particularly important for supporting the development of individual interest.

It is important to note that although perceived relevance can trigger and/or maintain interest, situational interest does not require relevance. Interest can also be triggered by novelty, surprise, or other collative factors that capture attention (Berlyne, 1970; Palmer, 2009) and can be maintained through engagement (Mitchell, 1993). However, development of individual interest requires increasing stores of value (and knowledge) and increasing identification (Hidi & Renninger, 2006; Renninger & Hidi, 2016), and any stimulus that is valued and part of the individual's identity is, by definition, relevant to that individual. Therefore, interest and relevance will often co-occur and may be mutually reinforcing, particularly as individual interest develops and the person becomes more knowledgeable about the topic. Relevance may trigger situational interest, which may further support interest development. In turn, as interest develops, the person's knowledge, value, and identification with the object of their interest may lead him or her to discover new and more personally meaningful relevance connections.

The expectancy-value model of achievement-related choices

Eccles' expectancy-value model (Eccles et al., 1983) stipulates that the most proximal predictors of individuals' achievement-related choices (e.g., task choices, persistence, effort) and performance are success expectancies and subjective task values. The model differentiates four task values: intrinsic value (also called interest/enjoyment value: the value a task holds because it is enjoyable), attainment value (the value a task holds because doing well is important for the individual's personal or social identities), utility value (the value a task holds because it is useful for achieving current or future goals), and cost value (the negative aspects of choosing the task over other alternatives). Expectancies and subjective task values, in turn, are developmentally and dynamically influenced by cultural norms, experiences, aptitudes, beliefs, and attitudes.

Questionnaire measures of the positive task values (i.e., intrinsic, attainment, and utility values) have fairly high intercorrelations and are often treated as a single task-value scale (Eccles & Wigfield, 2000). Indeed there is some conceptual overlap, especially among utility and attainment value (Eccles, 2009). For example, if science is relevant to a goal that constitutes an important part of identity (e.g., a career goal), it can have both utility and attainment value. However, all three positive task values are theoretically and empirically distinguishable, particularly in high-powered studies. In fact, Gaspard, Dicke, Flunger, Schreier, et al. (2015) differentiated among different subtypes of utility value (based on goal domains—school, daily life, career, social life, future), and attainment value (importance of achievement, personal importance).

The role of relevance in the expectancy-value model lies in two task values, utility and attainment, which correspond to relevance as personal usefulness and identification, respectively. Intrinsic value, on the other hand, does not require relevance. Although enjoyable tasks may often be considered relevant, enjoyment does not require perceptions of relevance. Accordingly, a task need not be relevant to have some intrinsic value for the individual.

One point of departure between our concept of relevance and Eccles's concepts of utility and attainment value is that Eccles does not place utility and attainment on a continuum (Eccles, 2005). Although Eccles (2009) notes the integral role of identity in achievement-related choices, she does not designate it as more personally significant than other task values. In contrast, we consider attainment value to be a more personally meaningful form of relevance than utility value. This key difference has implications for the ways in which task value and relevance are quantified. Relevance in our framework can be quantified on two different dimensions—magnitude and personal meaningfulness. In other words, a given relevance connection can be more or less personally meaningful (i.e., can be classified along the continuum from personal association to identification) and be strong or weak in magnitude (i.e., can be classified along a second continuum from a low to high degree of relevance). Task value, on the other hand is quantified only in terms of magnitude.

We believe this distinction is important because more-personally-meaningful relevance connections should generally be more powerful determinants of behavior (e.g., choices of activities, courses,

careers). For example, the student who is just beginning to think of him- or herself as a math person (low degree of identification/attainment value) will probably be more likely to join a math club than the student who believes math is very useful for calculating sale prices, because identification is more personally meaningful than usefulness. Thus it is important to quantify relevance both in terms of magnitude and personal meaningfulness.

Self-determination theory

Self-determination theory (Deci & Ryan, 1985) posits three basic human needs—competence, relatedness, and autonomy—that contribute to well-being. Applications of this theory to motivation in education focus primarily on differentiating between intrinsic and extrinsic motivation and between internal and external regulation (Deci, Vallerand, Pelletier, & Ryan, 1991). First, when students are intrinsically motivated they engage in learning activities because they are seen as enjoyable in their own right, whereas extrinsically motivated students engage in learning activities as a means to an end. Second, internally regulated behaviors are freely chosen by the individual, whereas externally regulated behaviors are engaged in due to some external contingency or control. According to self-determination theory, intrinsically motivated behaviors are more adaptive because they are internally regulated and fully autonomous.

Extrinsically motivated behaviors can fall into four categories based on the degree of internalization (i.e., the degree to which the behavior is externally versus internally regulated and therefore the degree to which autonomy is threatened versus supported; Deci & Ryan, 1985). For example, engaging in a learning task can reflect fully external regulation (to avoid externally imposed punishments such as being scolded), introjected regulation (to avoid self-imposed punishments such as shame), identified regulation (because it is useful for achieving a personal goal), or integrated regulation (because it is integrated into the identity). Therefore, through the process of internalization, a student who begins an academic task in order to avoid failing a test might come to accept this goal of engaging in the task as their own and even come to enjoy it.

The internalization process is analogous to the relevance continuum. Introjected and identified regulation involve perceptions of personal usefulness (e.g., for avoiding shame or becoming a well-rounded individual, assuming those goals are valued by the individual). Integrated regulation involves identification. Prior theorizing has also linked internalization to task values (Eccles, 2005). Introjected and identified regulation are linked to utility value, and integrated regulation is linked to attainment value. Therefore, increased internalization should be associated with increasingly meaningful types of relevance and vice versa, such that the different types of relevance and the different types of regulation may be mutually reinforcing.

Implications for the relevance framework

Our analysis of the role of relevance in the four-phase model, the expectancy-value model, and self-determination theory has several implications for our relevance framework. First, our analysis suggests that the three types of relevance are consistent with conceptualizations of relevance within these three theories, lending support for our continuum as a framework for synthesizing relevance research across theoretical models. Second, the four-phase model and self-determination theory are also consistent with our conceptualization of relevance along a continuum of personal meaningfulness. Furthermore, because of the important role of identification in well-developed individual interest (Renninger, 2009; Renninger & Hidi, 2016) and integrated regulation (Deci et al., 1991), as well as the role of identity in expectancy-value theory (Eccles, 2009), these theories support our supposition that more personally meaningful types of relevance may have the most powerful motivational effects.

These three theories also provide insight into the mechanisms by which relevance is likely to promote positive educational outcomes; namely, increases in relevance are likely to be associated with increases in subjective task value (Eccles et al., 1983), interest development (Hidi & Renninger, 2006), and increasingly autonomous motivation (Deci & Ryan, 1985). Having established a definition of three

types of relevance and their role in three major theories, we now review eight relevance constructs that have received considerable attention in the literature and the educational interventions that derive from them.

Relevance as personal association

Our review of the literature identified one construct that exemplifies relevance as personal association. The *personalization* approach to relevance focuses on customizing instructional content for individual students (e.g., by integrating their names, preferences, or existing interests; Cordova & Lepper, 1996; Walkington & Bernacki, 2014). It can take a number of forms, such as individualized instruction materials (e.g., Høgheim & Reber, 2015; Walkington, 2013) or allowing students to choose among a range of instruction materials (e.g., Palmer, 2009; Patall, 2013). Although tailoring instructional materials to the unique interests or preferences of individual students is not without its practical challenges, recent advances in adaptive learning technologies have created opportunities to personalize the content in ways that would previously have been impossible (Collins & Halverson, 2009; Walkington & Bernacki, 2014).

The theory behind personalization is two-pronged (Walkington & Bernacki, 2014). First, personalization is hypothesized to trigger interest and increase perceived value through relevance to the students' lives and interests (i.e., by providing opportunities for students to discover a personal association with the content). For example, instructors may survey students about their interest in a range of topics (e.g., food, movies, sports) and then present math problems in the context of students' preferred topics. These personalized problems are more likely than generic problems to be fun and also convey value. This is a "foot in the door" relevance intervention. Giving students opportunities to discover a personal association with the content provides a motivational boost for completing the math problems and may open the door to discovering more-personally-meaningful types of relevance. Second, personalization can improve learning through the process of *grounding* (Goldstone & Son, 2005). Personalization allows students to make connections between their knowledge about other topics (e.g., movies, sports) and math concepts. Thus students can use their existing knowledge to comprehend the concepts at hand.

Walkington (2013) used an intelligent tutoring system to deliver math problems that were context-personalized to Algebra students' out-of-school interests (e.g., problems about sports for sports fans). She found that students receiving personalized math problems solved them faster and more accurately, with the strongest effects for students who were struggling in the course. In another study with middle school students, Høgheim and Reber (2015) either presented context-personalized math problems or gave students a choice of examples that were related to common interests (e.g., movies). They found positive effects of both types of interventions on triggered and maintained situational interest, with the strongest effects for students with low initial interest in math. In addition, context personalization had a positive effect on perceived value for students with low initial interest. They also tested whether the intervention effects were moderated by success expectancies and found that the effects of context personalization on perceived value and maintained situational interest were stronger for students with low success expectancies.

By relating schoolwork to students' existing interests, personalization interventions promote perceptions of personal association to trigger and incur the benefits of situational interest (increased attention and engagement, desire to learn more; Renninger & Hidi, 2016), to increase perceived usefulness of the academic content for engaging in existing interests, and to promote learning through grounding effects (Walkington & Bernacki, 2014). Walkington (2013) found positive effects of personalization on performance but did not measure interest. Høgheim and Reber (2015) found effects on interest but not on performance. Therefore more research is needed before we can understand when personalization should impact interest, performance, or both. One possibility is that personalization, which can work through multiple mechanisms (e.g., interest development, perceived value, grounding), could promote different outcomes for individuals facing different motivational challenges.

Relevance as personal usefulness

Utility value

Relevance as personal usefulness, and utility value in particular, is the most widely researched type of relevance. As discussed above, utility value (UV) refers to the value a task has for an individual because it is useful for achieving current or future goals (Eccles et al., 1983). It is considered the most extrinsic of all the task values, because tasks are pursued not for their own sake but as a means to achieving a goal (Eccles, 2005). The relatively extrinsic nature of UV (compared to intrinsic or attainment value) may make UV the best suited of all the task values for external intervention (Harackiewicz & Hulleman, 2010). In other words, it may be easier to help students find external applications of academic tasks to their own personal goals than to convince students that tasks are interesting (intrinsic value) or important for their identity (attainment value).

Two strategies have been used to promote perceptions of UV: directly communicated and self-generated (Canning & Harackiewicz, 2015). Directly communicated UV strategies involve telling students that the material they are learning is useful and providing examples of utility. Self-generated UV strategies involve asking students to reflect upon and generate their own ideas of potential uses for the material, typically in a writing exercise. Here we review four different categories of interventions that use these two strategies alone or in combination.

Directly communicated–utility-value interventions

In a study by Durik and Harackiewicz (2007), participants learned a novel math technique using an instructional notebook that either explained the usefulness of the technique (e.g., for calculating tips and for future careers) or contained no such information. They found that the UV intervention increased interest in the math technique among individuals with higher initial interest in math. Other studies have examined the moderating role of success expectancies (also called perceived competence in much of this literature) using the same paradigm (Canning & Harackiewicz, 2015, studies 1 and 2; Durik, Shechter, Noh, Rozek, & Harackiewicz, 2015). These studies found positive effects of a directly communicated UV intervention on interest in and performance regarding the math technique among individuals with high-success expectancies and negative effects for individuals with low expectancies, suggesting that directly communicated–utility-value intervention effects were moderated similarly by perceived competence and interest.

Together, this work suggests that telling students that what they're learning is useful may backfire for uninterested or less confident students. However, Canning and Harackiewicz (2015, Study 3) found that the negative effects of the UV intervention for individuals with low success expectancies could be countered by emphasizing everyday (proximal) uses for the math technique rather than its importance for distal goals (e.g., pursuing future careers). In other words, telling students that the material is useful for their careers may impose pressure to master the material and could be discouraging or even threatening for students who lack confidence in their ability. In contrast, everyday uses (e.g., using math to calculate tips) that do not impose much pressure could benefit all students. Notably, culture may play a role in this pattern; among East Asian students, distal UV may be more beneficial, even among students with low initial interest (Shechter, Durik, Miyamoto, & Harackiewicz, 2011).

Vansteenkiste and colleagues also examined the effects of different types of UV information (Vansteenkiste, Simons, Lens, Soenens et al., 2004; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Adopting a self-determination theory framework, they argued that UV effects would depend on whether the task was useful for intrinsic goals (those that are inherently valuable for satisfying innate needs for autonomy, relatedness, and competence, such as affiliation or personal growth) versus extrinsic goals (those focused on obtaining rewards or positive evaluations, such as money or fame). Across several field studies they found that UV information emphasizing intrinsic goals (e.g., personal growth) resulted in greater performance and persistence and deeper processing, compared to UV information that emphasized extrinsic goals (e.g., money; Vansteenkiste, Simons, Lens, Sheldon et al., 2004) or UV information emphasizing both types of goals (Vansteenkiste, Simons, Lens, Soenens et al., 2004).

This work is further evidence that goal content matters: The effects of perceptions of personal useful-ness may be most positive when the learning material is connected to intrinsic goals.

One possibility is that the differential effects of connecting learning material to different types of goals are related to how personally meaningful those goals are for students. For example, students with low confidence in math are unlikely to have math-related career goals, such that communicating the value of math for various careers will not effectively increase their perceptions of personal usefulness and may even backfire (Canning & Harackiewicz, 2015). Similarly, intrinsic goals may be more person-ally meaningful than extrinsic goals, which would explain why connecting learning material to intrinsic goals would have more positive effects than connection to extrinsic goals (Vansteenkiste, Simons, Lens, Sheldon et al., 2004; Vansteekiste, Simons, Lens, Soenens et al., 2004).

Parents also play an important role in communicating the usefulness and importance of school sub-jects to their children. Harackiewicz, Rozek, Hulleman, and Hyde (2012) implemented a directly com-municated UV intervention for parents of high school students. They sent parents two brochures and a website that explained the utility of STEM courses for their teens and provided guidance on how to communicate that value to their teens. Students whose parents received this intervention reported more conversations with their parents about the importance of STEM, reported higher levels of per-ceived value, and took, on average, one more semester of math and science courses in high school. Importantly, these effects had long-term consequences for students' educational trajectories. A five-year follow-up indicated that increased STEM course taking in high school was predictive of college STEM majors, course taking, and career aspirations (Rozek, Svoboda, Harackiewicz, Hulleman, & Hyde, 2017). This is one case in which promoting personal usefulness in the short-term may have pro-moted identification in the long term, as indicated by students' career aspirations. Taking additional STEM courses in high school appears to have increased the likelihood of identification as a future STEM professional.

Self-generated–utility-value interventions

Laboratory tests of self-generated UV interventions found that having participants write about how they could use a new math technique in their own lives increased their interest (Hulleman, Godes, Hendricks, & Harackiewicz, 2010, Study 1) and performance (Canning & Harackiewicz, 2015, Study 1), particularly among those with low-success expectancies. These laboratory studies were the basis for devel-oping curricular interventions that use utility-value writing tasks as course assignments.

Curricular UV interventions have been implemented in high school science (Hulleman & Harackie-wicz, 2009), college psychology (Hulleman et al., 2010; Hulleman, Kosovich, Barron, & Daniel, 2017), and college biology courses (Harackiewicz, Canning, Tibbetts, Priniski, & Hyde, 2016). In each case, students in the intervention condition were instructed to write about the relevance and usefulness of course concepts; whereas, students in the control condition wrote summaries of the material. In high school science, the intervention was implemented as course assignments completed every 3–4 weeks during class time. The intervention increased interest in science and second-quarter–course grades for students with low-success expectancies but not for students with high-success expectancies (Hulleman & Harackiewicz, 2009). In college psychology, the intervention involved two extra-credit writing assignments. This intervention had positive effects on interest and inclination to major in psychology for students who had performed poorly on the first two exams (Hulleman et al., 2010, Study 2).

Finally, in several sections of an introductory college biology course, the UV intervention was imple-mented as three course assignments and had positive effects on grades among students with lower incoming GPAs (Harackiewicz et al., 2016). In addition, the intervention was particularly effective for underrepresented minorities who were also first-generation–college students, closing the achievement gap for these students by 61%. These students were particularly driven by a desire to use their educa-tion to help others. Harackiewicz et al. (2016) hypothesized that the intervention provided opportuni-ties for students to connect course material to their valued goals.

Together, this work suggests that self-generated UV interventions can be implemented at scale in a variety of high school and college courses, with the potential to improve educational outcomes for stu-dents at risk of poor performance. In particular, the work by Harackiewicz et al. (2016) suggests that

the UV writing intervention might be used to close achievement gaps, particularly if the intervention can be tailored to address the particular values and goals of underrepresented groups (Harackiewicz & Priniski, 2017).

Interventions that incorporate multiple strategies

Laboratory work by Canning and Harackiewicz (2015, Study 2) suggests that directly communicated and self-generated UV strategies can be combined, with synergistic effects on interest and performance for students with low-success expectancies. Combining these approaches may help students to see a range of possible personal connections (through directly communicated UV information) before reflecting and elaborating on these connections in self-generated UV tasks. Gaspard, Dicke, Flunger, Brisson et al. (2015) tested this combined strategy in ninth-grade math, with a class session about the utility of math and importance of effort (to reassure low-expectancy students that anyone can succeed at math with effort) and one of two self-generated UV tasks. Students completed either the typical UV writing task (Hulleman & Harackiewicz, 2009) or a quote-evaluation task in which students read quotes from other students about how they used math and then wrote about ways in which the quotes were personally relevant. Students who received this intervention reported higher levels of perceived UV than a control group, particularly in the quotes condition. The quotes condition also had positive effects on attainment and intrinsic values.

Value-reappraisal interventions

The value-reappraisal intervention is unique in that it aimed to teach students how to recognize negative attitudes toward their coursework and change them by considering the usefulness of the information and skills they were learning (Acee & Weinstein, 2010). The computer-based intervention included directly communicated information about the usefulness of statistics, as well as its intrinsic and attainment value. Students were also instructed to write about examples of usefulness in their own lives (i.e., to self-generate UV examples) and encouraged to think of ways that statistics could be enjoyable and important. This intervention had positive effects on students' perceptions of value and on their tendency to access two optional websites related to statistics concepts and careers (a behavioral measure of interest; Acee & Weinstein, 2010).

Thus, across several different paradigms there seems to be a real advantage of first learning about the utility value of course material and then writing about it. Students may benefit from the scaffolding provided by directly communicated UV information, which may open students to the possibility that the learning material could be useful and even give students some ideas about how the material relates to their own lives. One possibility is that the process of writing about utility value allows students to personalize and internalize the directly communicated messages, thereby, making the material more personally meaningful.

Endogenous instrumentality

Instrumentality is a synonym for utility, but whereas UV derives from expectancy-value theory, instrumentality derives from future-time-perspective theory (Husman & Lens, 1999; Husman, Derryberry, Crowson, & Lomax, 2004). This approach recognizes that students can be motivated by both immediate and more distant future goals. For example, a student working on an assignment may be motivated both to earn a good grade in that course and to maintain a high GPA to get into college. Instrumentality researchers differentiate two types of instrumentality (Husman & Lens, 1999; Husman et al., 2004). Tasks that have e*ndogenous instrumentality* are directly related to the long-term goal (e.g., studying for the LSAT to get into law school; Husman et al., 2004). Tasks that have *exogenous instrumentality* are not directly related to the long-term goal (e.g., passing a biology course to get into law school). Husman and Lens (1999) argued that endogenous instrumentality is closely related to Deci and Ryan's (1985) concepts of identified and integrated regulation and should therefore have more positive effects on educational outcomes than exogenous instrumentality. Indeed, correlational evidence suggests that endogenous instrumentality can support intrinsic motivation (Husman et al., 2004).

Although there is no intervention specific to endogenous instrumentality, the value reappraisal intervention described above (Acee & Weinstein, 2010) had positive effects on both perceived value and endogenous instrumentality, which were highly correlated. Thus the instrumentality perspective on personal usefulness offers a more nuanced look at how learning material can be connected to a personal goal—indirectly (exogenously) or directly (endogenously)—but utility value and endogenous instrumentality should typically be highly related. That being said, the instrumentality perspective may be especially important for understanding the effects of perceived relevance for more distal goals. The more directly the material is connected to the goal, the more personally meaningful that material is likely to be and, therefore, the more positive the effects of perceived personal usefulness.

Affordances

According to role congruity theory, social roles (e.g., gender roles) influence which goals individuals are likely to pursue, and this process can explain gender differences in career pursuits (Diekman, Brown, Johnston, & Clark, 2010; Diekman & Steinberg, 2013; Diekman, Steinberg, Brown, Belanger, & Clark, 2017). For example, women's social roles emphasize caretaking; therefore, women will be more likely to pursue goals of working with or helping others (i.e., communal goals; Diekman et al., 2010). Work-goal affordances, in turn, are individuals' perceptions that a particular field or career can afford opportunities to achieve their goals.

Diekman and others have shown that all people hold communal goals to some degree, but they are particularly strong among women (Diekman & Steinburg, 2013), underrepresented racial and ethnic minorities (Thoman, Brown, Mason, Harmsen, & Smith, 2015; Torres, 2009), and first-generation college students (Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012), likely because communal goals are consistent with social roles in these groups. This is an important point because it highlights the potential overlap between personal usefulness and identification. When achieving communal goals is integral to living out a valued social role, the relevance of communal careers is likely to include both personal usefulness and identification, because entering into helping professions would both fulfill communal goals and affirm the individual's social identity. Thus, work-goal affordances will often involve both personal usefulness and identification. We will return to this point later.

Interventions based in goal-congruity theory typically focus on increasing the perception that STEM careers can provide communal work-goal affordances, because these fields are often perceived to be incongruent with communal goals (Diekman et al., 2010; Diekman, Clark, Johnston, Brown, & Steinburg, 2011). For example, Diekman et al. (2011) gave participants a description of a day in the life of a scientist that focused on either collaborative or independent aspects of science. Participants in the collaborative framing condition reported more-positive attitudes toward science careers. This effect was stronger among women than men and was mediated by perceived communal goal affordances. Similarly, Brown, Smith, Thoman, Allen, and Muragishi (2015) gave participants descriptions of a biomedical research program emphasizing how the research would be used to help others, or not, in a directly communicated UV intervention. They showed that describing the UV of science for communal goals increased communal affordances, perceived importance of science, and in turn positivity toward biomedical research and motivation to pursue a career in biomedical science. Thus the affordances perspective on personal usefulness provides a strategy for increasing motivation for a particular domain, by helping students to see how careers in that domain are consistent with valued social roles.

Self-transcendent purpose for learning

The self-transcendent purpose for learning (also called "purpose" or "purpose for learning") is defined as a learning goal that is motivated by the desire to both benefit oneself and have a positive impact on the world (Yeager & Bundick, 2009; Yeager et al., 2014). For example, a student may pursue a degree in agriculture because he or she enjoys gardening and wants to promote community health through farm-to-table food sourcing. Self-transcendent purpose is theorized to give students a sense of meaning that can make boring school tasks bearable.

The purpose intervention involves (a) priming self-transcendence by having students write about ways in which the world could be a better place, (b) establishing a norm of purpose goals by presenting statistics and quotes from previous students, and (c) having students write a testimonial for future students about their own reasons for learning (Yeager et al., 2014). As was the case with work-goal affordances interventions, the purpose intervention targets broad, value-laden goals that may be core to an individual's identity, such that purpose may include both personal usefulness and identification. One notable difference between this intervention and other personal usefulness interventions reviewed here is that the purpose intervention does not focus on *how* learning helps students achieve their goals. Rather it increases the salience of self-transcendent goals with the implicit assumption that school will help achieve those goals.

The purpose intervention was implemented in high school classes with positive effects on math and science GPA, especially among students with low GPAs (Yeager et al., 2014, Study 2). The proposed mechanism for these effects is improved self-regulation and persistence on boring academic tasks. This hypothesis is supported by two studies (Yeager et al., 2014, studies 3 and 4). In a purpose intervention implemented as an extra-credit activity in a college psychology course, students in the intervention condition appeared to use more deep-learning strategies on a tedious exam review. In a laboratory study, participants were repeatedly given choices between completing more math problems or more enjoyable activities. Students in the intervention condition chose to complete math problems more often, especially later on in the task when it became more boring (Yeager et al., 2014).

Implications for relevance as personal usefulness

As the most heavily researched type of relevance, personal usefulness is associated with the greatest number of constructs and intervention approaches. All four of the constructs reviewed here are closely related. In fact, we would argue that all are types of UV, but with different points of emphasis. Endogenous instrumentality focuses on how current tasks are perceived as a useful step toward an important long-term goal. Work-goal affordances focus on how useful a career or field is for fulfilling important goals. Self-transcendent purpose focuses on both self-focused and self-transcendent reasons for pursuing future goals and the usefulness of education for achieving them. As the broadest of the personal usefulness constructs, UV includes usefulness for any type of goal and therefore subsumes instrumentality, affordances, and purpose. In fact, we believe UV to be broad enough to be functionally synonymous with personal usefulness. Personal usefulness is the perception that a stimulus can be used to fulfill an important personal goal, and UV is the value a stimulus has for the individual because it can be used to fulfill a personal goal. Thus a stimulus will be perceived as having utility value to the extent that it has the personal-usefulness type of relevance to the individual.

Personal usefulness is associated with a range of outcomes (e.g., interest, performance) for various groups of individuals (low performers, individuals with low-success expectancies or initial interest). Research on UV, in particular, has begun to explore the reasons behind these differential effects. Durik and colleagues argued that success expectancies were the more important moderator for UV interventions (Durik, Hulleman, & Harackiewicz, 2015). They hypothesized that individuals with low expectancies may become anxious when told directly that a task is important for achieving their goals. However, given the opportunity to explore possible uses for the task in their own lives for themselves, these same individuals may be able to think of low-pressure uses and therefore benefit from self-generated UV information.

Researchers have also examined the impact of connections to different types of goals, comparing proximal versus distal goals (Canning & Harackiewicz, 2015; Shechter et al., 2011), intrinsic versus extrinsic goals (Vansteenkiste, Simons, Lens, Sheldon et al., 2004; Vansteekiste, Simons, Lens, Soenens et al., 2004), and communal versus agentic goals (Brown et al., 2015). Gaspard and colleagues' empirical demonstration of multiple UV facets (e.g., utility for school, career, future; Gaspard, Dicke, Flunger, Schreier et al., 2015) suggest that there may be value in comparing different types of usefulness. An exciting line of work in this area is the potential for UV interventions to address achievement gaps by targeting the particular goals of underrepresented students (Brown et al., 2015; Harackiewicz et al., 2016).

Relevance as identification

Theory and research suggest that perceptions of identity impact motivation and decision-making, as individuals are driven to engage in activities and behaviors that confirm or are consistent with their identities (e.g., Eccles, 2009; Oyserman, 2007). Therefore, identification—the inclusion of an object/topic/activity in the individual's identity—carries those same motivational benefits. For example, as noted earlier, well-developed individual interest involves identification with the object of interest and such well-developed interest is associated with important academic outcomes (Renninger & Hidi, 2016). Within a given learning situation, individual interest is a strong predictor of attention, task persistence, and learning (Hidi & Harackiewicz, 2000). Individual interest is also an important predictor of more-distal academic decisions. Harackiewicz, Durik, Barron, Linnenbrink-Garcia, and Tauer (2008) measured participants' individual interest in an introductory college psychology course and found that students with higher levels of individual interest took more psychology courses and were more likely to declare a psychology major seven semesters later. These results suggest that identification can play an important role in shaping students' educational trajectory.

Attainment value

Attainment value is derived from Eccles et al.'s (1983) expectancy-value model and refers to the value tasks have due to (a) the personal importance of doing well on or participating in those tasks and (b) the centrality of the tasks to core social or personal identities. There are no interventions specifically designed to target attainment value. However, any of the personal-usefulness interventions above could enhance attainment value if the tasks are perceived as useful for obtaining identity-relevant goals. For example, a student who identifies as a musician would find practicing the guitar to have both utility value (for improving guitar skills) and attainment value (because practicing is part of his or her guitarist identity). Supporting this possibility, the quote-evaluation UV intervention implemented by Gaspard, Dicke, Flunger, Brisson et al. (2015) was found to increase both utility and attainment values for math.

Correlational and longitudinal research provides further support for the important role of attainment value in learning environments. Historically, researchers have struggled to empirically separate attainment value from intrinsic and utility values, so most studies have used composite measures of subjective task value (e.g., Husman et al., 2004; Wang, 2012). However, researchers have more recently separated intrinsic, utility, and attainment values using factor analytic techniques that account for subfacets of each type of value (Gaspard, Dicke, Flunger, Schreier et al., 2015). Using this approach, Guo et al. (2016) found that students' attainment value for math was predictive of their self-reported effort and teacher-rated engagement in math, controlling for the effects of intrinsic and utility values. This study points to the importance of attainment value and demonstrates an important route through which relevance interventions may operate.

Identity-based motivation

Identity-based motivation is similar to attainment value in that motivation is presumed to be maximized when tasks are perceived as consistent with one's identity (Oyserman, 2007). Different identities can be salient at different times, which provides a possible lever for intervention (Hugenberg & Bodenhausen, 2004). For example, imagine a person whose identities include being a good student and being popular. Depending on which is most salient during a boring history lecture, this student might diligently take notes or check Facebook. Thus a key to promoting student success might be to keep school-relevant identities salient during class.

Correlational evidence suggests that having an education-dependent future identity (e.g., a lawyer, doctor) versus an education-independent future identity (e.g., athlete, movie star) is related to earning higher grades in middle school (Destin & Oyserman, 2010, Study 1). Furthermore, interventions that make these education-dependent identities salient have proven effective in enhancing important educational outcomes. An after-school intervention for African American middle school students that

taught youth to imagine themselves as successful adults and connect those future identities to current school involvement increased students' concern about doing well in school, school bonding, strategies to attain possible selves, and school attendance and decreased misbehavior among male students (Oyserman, Terry, & Bybee, 2002).

A similar intervention implemented with eighth-graders led to higher academic initiative (e.g., active participation, doing more than assigned work) and performance and to lower rates of depression, absence, and misbehavior (Oyserman, Bybee, & Terry, 2006). Finally, an intervention in which middle school science students were randomly assigned to read information about incomes of education-dependent careers (showing higher earnings with higher levels of education) increased reported plans to spend more free time on schoolwork and the likelihood of completing an extra-credit assignment compared to a control condition presenting education-independent careers favorably, comparing median earnings to those of musicians, actors, and athletes (Destin & Oyserman, 2010, Study 2). These studies highlight the potential for interventions that make education-dependent identities salient to improve student outcomes.

Culturally relevant education

It has long been recognized that groups of students who do not "match" the dominant (White, middle-class) culture of education in the United States tend to underperform compared to their majority-group peers (e.g., Irvine, 1990; Stephens et al., 2012). Culturally relevant education (CRE) theories, exemplified by Ladson-Billings' (1995) culturally relevant pedagogy and Gay's (2000) culturally responsive teaching, rejected typical deficit-based understandings of performance differences in favor of an asset-based approach (Paris, 2012). CRE focuses on cultural competence (recognizing and honoring one's own and others' cultures), critical consciousness of sociopolitical injustice, and a belief that all students can and must experience academic success (Ladson-Billings, 1995). It leverages cultural knowledge, experiences, and perspectives of diverse students to make learning more authentic, relevant, and effective for all students (Gay, 2000).

Although there is a dearth of experimental evidence on the effectiveness of CRE, existing evidence suggests that CRE can benefit all students, including both underrepresented and majority groups. A review of existing studies (mostly case studies or pre-post assessments) suggested that these practices can improve student interest and engagement and, in some cases, performance (Aronson & Laughter, 2016). Dee and Penner (2017) estimated the causal effects of a CRE program in several San Francisco high schools with a regression discontinuity design. Ninth-graders with GPAs below 2.0 were automatically enrolled in an ethnic studies course. Compared to students just above this 2.0 cutoff (who were not automatically enrolled in the course), students assigned to the ethnic studies course had higher attendance rates and grades and earned more credits.

Another successful area of research and practice in CRE involves interventions for Native American students (see Kovach, 2009). For example, Unsworth, Riggs, and Chavez (2012) implemented a field-based summer geoscience program for Native American high school students focused on the role of science in Native American tradition, history, and culture and on the use of geoscience to manage natural resources near their reservations. Pre-post surveys revealed that students were more likely to recognize the role of science for their tribes and to identify with earth and rocks (i.e., they were more likely to select "earth" and "rocks" from a list as things that "make you who you are") after the program. These increases were associated with greater reported likelihood of going to college and becoming a scientist.

Implications for relevance as identification

Identification is the most personally meaningful type of relevance. Thus identification is likely to have the strongest effects on motivation, but it be a challenging target for intervention. The literature on identification interventions is small but promising. Ladson-Billings (1995) called for a new approach to teaching racial and ethnic minority students that would respect and appeal to their cultural

identities, and the culturally relevant education movement that ensued is evidence of the potential for identification with school to bring about both educational and social change (Paris, 2012). The literature on possible selves and identity-based motivation interventions is also promising. These interventions have had effects on important educational outcomes, including attendance, disciplinary actions, performance, and school bonding (Destin & Oyserman, 2009; Oyserman et al., 2002, 2006). Rather than try to impact identity, per se, these interventions recognize that people have multiple identities and that motivation can depend on which identities are most salient in a given context (Oyserman, 2007).

Another approach would be to promote identification indirectly. Perceptions of personal association or personal usefulness may provide a foundation for identity exploration (Kaplan, Sinai, & Flum, 2014), such that interventions targeting personal association or personal usefulness may ultimately promote identification for some students. For example, some personalization interventions connect course material to students' existing interests. These relatively superficial connections to broad categories of interest may really hit home for some students, triggering them to think more deeply about personal connections. Similarly, self-generated UV interventions allow students to connect course material to any aspect of their lives. Students may spontaneously make identity-relevant connections while engaging in this type of reflection. Career goals are often central to individuals' identities, especially during adolescence and early adulthood (Eccles, 2009). Therefore, work-goal affordances might be especially likely to promote identification. In any of these cases, fostering perceptions of personal association or personal usefulness may also foster identification for some students.

Discussion

Relevance manifests in the motivation literature as a variety of constructs from a variety of theoretical frameworks. The proposed conceptualization of relevance as a continuum of personal meaningfulness ranging from personal association to identification is useful for categorizing the many interventions and measures employed by researchers and the understanding the relationships among the various constructs and broader theories of motivation. However, it is important to note that the three types of relevance are more accurately described as overlapping areas on a continuum than as mutually exclusive categories. Perceiving a relationship between a task and something personally valued (i.e., personal association) is not always very different from perceiving a *useful* connection between them. Indeed personalization interventions are hypothesized to increase both interest and perceived personal usefulness by relating schoolwork to existing interests (Walkington & Bernacki, 2014). Likewise, perceived personal usefulness is not always very different from identification, particularly when tasks are perceived as useful for attaining identity-based goals (Eccles, 2005). Therefore, whereas the different types of relevance are important to distinguish, the precise location of the cutoffs between them is unlikely to have deep theoretical or practical implications.

Blurry though the lines may be, we believe the relevance continuum is useful for conceptualizing the relationships among various relevance constructs and for the role of relevance in different phases of interest development (Hidi & Renninger, 2006), in the process of internalization (Deci & Ryan, 1985), and in the promotion of task values (Eccles et al., 1983). It is our hope that the proposed relevance framework will provide a platform for conversation and collaboration among researchers and fuel new lines of inquiry. Two future research directions seem most pressing: to clarify the role of individual differences in moderating the effects of relevance interventions and to identify the mechanisms by which different interventions promote positive educational outcomes.

Directions for future research—individual differences

The literature reviewed here includes a variety of interventions with effects on many different dependent variables (e.g., interest, performance, perceived value, self-regulation, attitudes) moderated by several individual-difference measures (e.g., initial interest, success expectancies, prior performance,

gender, minority status). An important question for relevance researchers is which intervention should be related to which outcome and for which group of students? Indeed, systematic measurement and testing of individual-difference moderators has been identified as an important avenue of future research on motivational interventions broadly (Rosenzweig & Wigfield, 2016; Harackiewicz & Priniski, 2017).

One intriguing possibility is that different moderators could operate in different areas of the relevance continuum. Although most studies do not report tests of moderation by both interest and success expectancies, there is some evidence to suggest that interest may be a more important moderator for personal-association interventions whereas success expectancies may be a more important moderator for personal-usefulness interventions. In their review, Durik, Hulleman, and Harackiewicz (2015) concluded that initial levels of interest moderate interventions targeting situational interest, whereas the critical moderator of utility-value interventions, which typically target both performance and maintained interest, is success expectancies.

Experimental studies that tested both interest and success expectancies as moderators support this view. Durik, Shechter, and colleagues (2015) found that success expectancies were the stronger moderator of the effects of directly communicated UV information. In contrast, Høgheim and Reber (2015) found that personalization and choice interventions (which targeted personal association) were moderated by initial interest. The only personalization effects that were also moderated by success expectancies were on perceived value and maintained interest, which is consistent with the hypothesis that success expectancies may be an important moderator for personal usefulness. Perhaps success expectancies become more important for personal usefulness because a students' perception that they could use a task to achieve a goal is inherently tied to a perception that they have the competence to do so (Durik, Hulleman et al., 2015). In fact, Durik, Shechter, and colleagues (2015) manipulated expectancies in a laboratory study and found that an "expectancy boost" increased the effectiveness of a directly communicated UV intervention, providing further support for success expectancies as the moderator for usefulness interventions.

Moderators of identification interventions remain an open question. Although no moderated effects were reported for the interventions reviewed here, we hesitate to draw strong conclusions because of the dearth of studies. We see two likely possibilities. First, prior levels of identification might moderate the effects of identification interventions. Identity relevance might be more impactful for students who were not previously identified with the domain. On the other hand, promoting identity relevance might be equally motivating for all students but for different reasons. For those not previously identified with the domain, these interventions would create new identity-relevance connections. For those already identified with a domain, interventions could increase the strength or salience of identity relevance.

Directions for future research—mechanisms

In addition to clarifying which individual differences moderate each type of intervention (i.e., *for whom* each intervention works), there is a need to clarify the mechanisms by which interventions promote positive academic outcomes (i.e., *how* each intervention works). For example, identification may be uniquely effective for promoting positive educational outcomes through increased self-regulation. Integrated regulation, which is characterized by identification and has been linked to attainment value in prior theorizing (Eccles, 2005), is associated with more internal self-regulation. Similarly, identification is a characteristic of well-developed individual interest in the four-phase model, and this phase is associated with greater self-regulation (Hidi & Renninger, 2006).

One challenge for understanding mechanism that could be explored in future research is that students' responses to interventions intended to promote one type of relevance might encompass all three types. Consider a UV intervention that instructs students to write about the usefulness of chemistry in their own lives. Some will do just that. However, other students might write about how chemistry is related to something else they enjoy (e.g., cooking [personal association]). Still others will write about the usefulness of chemistry for achieving a desired future identity (e.g., scientist [identification]). Thus the same UV intervention could increase perceptions of personal association, usefulness, or

identification for different students. This type of treatment heterogeneity can be a great asset for an intervention that needs to reach a diverse group of students with different levels of initial interest or success expectancies. However, it is important to understand which types of relevance are affected by a given intervention and how the different types of relevance promote adaptive educational outcomes.

Future work should include assessment of all types of relevance and analysis of student interviews or writing (e.g., utility value essays) for different types of relevance. This would allow researchers to test which types of relevance are promoted by a given intervention and for whom. In addition, researchers should test whether increases in different types of relevance are predictive of different outcomes. For example, personal association may be a mechanism for increasing situational interest whereas identification may be a mechanism for promoting course taking. Ultimately, understanding treatment heterogeneity is key to understanding how interventions improve educational outcomes for different students and may lead to the development of better interventions. For example, future work could focus on identifying and refining interventions that target only a single type of relevance and interventions that flexibly promote different types of relevance for different students.

Implications for practice

Thus far we have focused on the implications of our relevance continuum for research. However, ultimately, the goal of research in education is to improve student outcomes. Currently, educators interested in helping their students to find the relevance of their coursework are confronted by a discordant literature with a variety of theories and interventions to increase perceptions of relevance. We hope this framework will lead to a more unified literature and clarity on which interventions might be most effective in a given classroom situation or for a given group of students. Indeed, if we want our research to have a positive impact on educational practice, we need to provide teachers with the tools to recognize the different types of relevance their students may perceive (i.e., personal association, personal usefulness, and identification) and then promote increasingly meaningful types of relevance. Only then will the work of researchers be optimally implemented to improve student outcomes.

Conclusions

Our review of relevance constructs, though not intended to be exhaustive, provides a picture of how interrelated the work on relevance is, despite being informed by a number of different theories. These lines of research are currently progressing in parallel. Entrenched in our own theoretical frameworks and our own vocabularies we fail to recognize the common overarching theme of relevance in our work. In fact, only about half of the articles we reviewed for this paper even contained the word *relevance*. Perhaps this is because there has been no theoretical framework that established relations among the various relevance constructs or even a clear definition of "relevance" as a motivation construct. We believe that the framework proposed here can provide a common language for understanding the benefits of perceived relevance for academic motivation and performance, and inform the design of interventions to promote these perceptions.

Acknowledgments

Funding

Note

1. Consistent with prior conceptualizations, we define identity as a collection of personal characteristics and abilities that are regarded as relatively stable but dynamically constructed qualities defining the self. Identity serves to differentiate the self from others (e.g., good at math) or connect the self to valued social groups (see Oyserman, Elmore & Smith, 2012, for a review).

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