Wise Interventions: Psychological Remedies for Social and Personal Problems

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Abstract

Long-standing social problems, such as poor school achievement, personal and intergroup conflicts, bad health, and unhappiness, can seem like permanent features of the social landscape. We describe a new approach to such problems. Rooted in basic research and theory in social psychology, wise interventions help people accomplish their goals and flourish by addressing how they make sense of themselves, other people, and social situations. We provide a comprehensive theoretical review and organization of wise interventions. This review emphasizes the importance of meaning-making in human behavior, how meaning-making is guided by three basic motivations, and how deleterious meanings can be changed with carefully designed interventions to cause lasting and consequential improvement for large numbers of people. We also emphasize how meanings arise within social contexts and thus how interventions cannot be understood or effectively implemented in isolation, how this approach complements and extends traditional approaches to social reform, which emphasize not meaning-making but objective change to situations or to the habits and abilities of individuals, and highlight high-leverage directions for future research.

Keywords: intervention, subjective construal, mindset, education
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I. Introduction

Consider the following everyday problems:

• A couple has a fight. How can they manage this conflict? Will it help to try to control their emotions and re-explain their views to one another? Is it best to simply not talk about the issue any more? Or would a specific kind of dialogue be fruitful?

• A teacher finds that her students respond poorly to critical feedback. Even though she wants to help her students improve, they seem discouraged. How can she give feedback in a way that motivates students?

• A social worker finds that a new mother in an at-risk family is increasingly angered by her difficulty getting her baby to sleep at night. How can he help her cope, and prevent abuse?

• A college administrator finds that first-generation and racial-ethnic minority students drop out at high rates, even when they enter college with strong academic credentials. How can she help these students succeed?

Problems like these can have substantial personal, societal, and economic costs: marriages fail; children do not learn; babies are harmed; and students drop out. How can we address them? And what, if anything, do they have in common? At root, we suggest, all social problems are, in part, psychological problems. To solve them, one must have a viable theory of human behavior that can be translated into effective ways of helping people accomplish their goals and flourish (Lewin, 1951). Although many such theories have been offered, we focus on an approach emanating from social psychology. This approach, which
we call *wise interventions*, involves a set of precise, theory- and research-based techniques that address specific psychological processes to help people flourish in diverse settings of life. Wise interventions emphasize subjective meaning-making—how people make sense of themselves and social situations—and, in doing so, can effectively change behavior in ways that accrue over time. (Walton, 2014; Walton & Dweck, 2008; Wilson, 2011; see also Goffman, 1963; Steele, 1997).

Wise interventions represent the application of modern psychological research to classic interests in the bases of social problems (Asch, 1952; Clark & Clark, 1947; Lewin, 1947). Indeed, in recent years, an explosion of wise interventions has addressed myriad social and personal problems. Many of these interventions are striking in their impact. Consider the problems mentioned above. One intervention comprised three 7-minute exercises designed to encourage couples to reflect on marital conflicts from the perspective of a neutral third party who wants the best for all (Finkel, Slotter, Luchies, Walton, & Gross, 2013). This 21-minute exercise prevented an otherwise typical decline in couples’ marital satisfaction over a year. A second involved a paper-clipped note appended to teachers’ critical feedback on middle-school students’ essays. The note conveyed that the teacher gave the feedback in an effort to help the student achieve a higher standard, which the teacher believed the student could reach. This raised the percentage of African American students who chose to revise their essay from 27% to 64%, and sustained minority students’ trust in school over the rest of the school year (Yeager, Purdie-Vaughns et al., 2014). A third involved training paraprofessionals to ask at-risk new mothers a series of simple questions about struggles in parenting on regular home visits over the baby’s first year. These questions encouraged mothers to see struggles as normal and solvable problems, not as meaning they were “a bad mom” or their child was “a bad baby.” This reduced the rate of
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abuse over the child’s first year from 23% to 4% (Bugental et al., 2002), reduced later aggression and stress markers in children, and improved children’s cognitive functioning at least through the age of three (Bugental, Schwartz, & Lynch, 2010). A fourth intervention used stories from college students to convey that it is normal to worry at first about whether you belong in college and these concerns pass with time. Delivered to first-year college students, this raised African American students’ grades over the next three years, halving the racial achievement gap (Walton & Cohen, 2011). Illustrating the policy implications, this and related interventions delivered online prior to college matriculation to full institutional cohorts improved first-year persistence and achievement for socially disadvantaged students in three samples (N>9,500), reducing achievement gaps by 31-40% at scale (Yeager, Walton, et al., 2016).

The results of these and many other interventions underscore three essential lessons: (1) specific psychological processes play a critical role in the unfolding of individuals’ behavior in the social world; (2) these processes can be altered in precise ways; and (3) doing so can lead to significant and lasting personal and social improvement.

What are these processes? When people lack an understanding of the bases of psychological interventions—of the processes they target, of how they may be changed, and of how change can be sustained over time—results like these can seem magical (Yeager & Walton, 2011). The purpose of this article is to provide a comprehensive review of wise psychological interventions and thus to demystify them. In so doing, we go beyond other reviews, which have focused on a single intervention (e.g., Cohen & Sherman, 2014) or content area (e.g., education, Yeager & Walton, 2011), or have provided only a high level summary (Walton, 2014). In clarifying this approach for researchers and policy-makers alike, we hope to inspire the further development and responsible use of wise interventions and its integration with other approaches
to social reform. Doing so, we hope, will both advance psychological theory and promote positive change.

Our focus is on the psychological processes targeted by wise interventions and their role in major social problems. We do not restrict our analysis to any one problem space. Instead, we emphasize critical processes that contribute to virtually all forms of human behavior, including personal issues (e.g., a lack of well-being), interpersonal problems (e.g., relationship problems, intergroup conflict), and major societal problems (e.g., persistent achievement gaps, lack of political participation) (for review methods, see Footnote 1). Although our focus is broad, we often illustrate key points in the context of education, because many wise interventions have been tested in this important context.

**Roadmap**

First, we describe the theoretical foundations of wise interventions and how these arise from basic research in social psychology. The chief insight is that people’s behavior stems from how they make sense of themselves and social situations and that this meaning-making is guided by three basic motivations: the need to be accurate, the need for self-integrity, and the need to belong. Second, we describe five principles that characterize wise interventions. Third, we describe specific strategies used to change meanings and group wise interventions into three “families” according to the three motives that guide meaning-making (accuracy, self-integrity, and belonging). Fourth, to illustrate the distinctive qualities of wise interventions, we compare them with two common approaches to social reform. Finally, we review implications and high-priority directions for future research.

**II. Theoretical Foundations of Wise Interventions: Social-Psychological Insights about Human Behavior**
Beyond wise interventions, two broad theoretical approaches have guided social reforms. One assumes that the key determinants of behavior are qualities of the actor—personality traits, genotypes, brain development, habits, and skills. Interventions based on this approach aim to equip people with the abilities they need to overcome obstacles and succeed in life, such as education in general (Brinch & Galloway, 2011) as well as specific programs designed to raise intelligence in children or resilience in adults (e.g., Jaeggi, Buschkuehl, Jonides, & Perrig, 2008).

A second approach focuses on the environment. It assumes that to flourish people need to be in situations that help them succeed rather than that constrain their behavior or close off opportunities (Sachs, 2005). This might involve increasing resources for schools, moving children to neighborhoods that provide greater opportunities (Sanbonmatsu et al., 2011), or altering incentive structures (Fryer, 2011).

These approaches address social problems whose root cause involves a lack of essential capacity—a deficit in either the skills or habits of the person or the resources, opportunities, or incentives in the environment. To succeed in any endeavor, people need adequate personal resources and an environment that allows them to draw on these resources effectively. In school, students need a basic level of ability and a conducive environment, including a stable home life, three meals a day, and skilled teachers, to succeed.

Wise interventions do not address a lack of capacity. Instead, they assume that among many people and in many situations there is often already significant room for improvement—that people are capable and situations afford opportunities yet people fail to take full advantage of these opportunities. Why? The answer involves meaning making.

Meaning-Making

A key tenet of social psychology is that how people interpret their personal qualities and
social situations determines their behavior (Asch, 1952; Heider, 1944; Jones & Davis, 1965; Kelley, 1973; Lewin, 1947; Ross & Nisbett, 1991). Even when people have the ability to succeed and are in environments that allow them to do so they may fail if they view their circumstances in a self-defeating manner.

A variety of terms have been used to describe these interpretations, including *subjective construal* (Ross & Nisbett, 1991), *mindsets* (Dweck, 2006), and *stories* (Wilson, 2011). To avoid confusion and awkward terminology we use colloquial synonyms like “meaning making” and “interpretation.” Regardless of the term, the key principle is that, to predict behavior, it is essential to get inside people’s heads and see how they understand their actions and circumstances. To predict how students will respond to a bad grade, for example, the key is how they understand that grade. Do they view it as a sign that they lack ability or that more effort or another type of effort is needed? Critically, this approach prioritizes the person and the situation together: how people make sense of situations, how situations contribute to this meaning-making, and the implications this meaning making has for their behavior and well-being.

Certainly some situations are so powerful that most people understand them in the same way. Some of social psychology’s most famous studies emphasize the power of the situation. Latané and Darley (1970) showed that the greater the number of people who witnessed an emergency, the less likely any one person would offer help. But even in these studies it was not the power of the objective situation per se that determined people’s behavior but how people understood it. The greater the size of the group the more likely people were to assume that no assistance was required, that someone else would or had already intervened, or that the responsibility to do so lay elsewhere.

Most events leave room for interpretation, ranging from the healthy to the toxic. Students
can interpret critical feedback from a teacher as an opportunity to improve their work. Or they can worry, accurately or inaccurately, that the teacher dislikes them, doubts their ability, or is biased. Here the goal of a wise intervention is not to restructure the school day so teachers have more opportunities to provide critical feedback (a situation-centric approach) or to teach students better study habits (a person-centric approach). It is to shape how feedback is represented to students and thus the meaning it conveys to them (Yeager, Purdie-Vaughns et al., 2014).

Just as there is considerable latitude in how people make sense of social situations, so there is latitude in how people make sense of themselves. Many people in Western society are exposed to the idea that intelligence is essentially fixed at birth, an idea reinforced by “Gifted and Talented” programs, a corporate focus on “talent” (Murphy & Dweck, 2010), a research preoccupation with IQ (Herrnstein & Murray, 1994; Jensen, 1969; Terman & Oden, 1947), and praise like “You’re so smart!” (Gunderson et al., 2013; Mueller & Dweck; 1998; see also Haimovitz & Dweck, 2016; Rattan, Good, & Dweck, 2012). Students who hold this fixed-mindset about intelligence interpret academic struggles as evidence that they lack ability or have reached the edge of their abilities. This inference undermines subsequent effort, persistence, learning, and achievement (Dweck, 1999; Dweck & Leggett, 1988). Growth-mindset of intelligence interventions teach students about modern neuroscience and the potential for intelligence to grow (“like a muscle”) with effort, effective learning strategies, and the help of others. This message does not provide students new learning resources (a situation-centric approach) or make students more intelligent (a person-centric approach). It changes the meaning of academic struggle. Struggle becomes an opportunity to learn, not a sign of limitations, and students respond with increased effort and resilience in pursuing learning opportunities. This message, conveyed in diverse developmentally appropriate exercises, has been shown to improve
performance over an academic term or longer among students in middle school (Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003), high school (Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015; Yeager, Romero et al., 2016), and college (Aronson, Fried, & Good, 2002; Yeager, Walton, et al., 2016). Often the greatest effects are for struggling students, for whom the meaning of academic struggle is most pressing (Paunesku et al., 2015; Yeager, Romero et al., 2016).

Although subjective meaning-making is a primary focus of social psychology, its importance is recognized across the social sciences. The seminal Coleman Report found that variation in school achievement within schools was much larger than variation between schools (Coleman et al., 1966). Why do some children struggle, even in high-achieving schools? And why do some children succeed even in struggling schools? One reason involves inequalities in family circumstances and the broader society, which children bring to school in the form of differences in preparation. But the Coleman Report also suggested that inequality can take a psychological form. Experiences of disadvantage can place a child in a circumstance in which “he cannot assume that the environment will respond to his actions…a general belief…that nothing he could ever do would change things.” If so, “it may well be…that one of the keys toward success for minorities which have experienced disadvantage and a particularly unresponsive environment…is a change in this conception” (p. 321). There is thus a need to understand how such beliefs and meanings arise and may be changed. This approach does not deny the powerful role of situational forces like discrimination and poverty. It rather aims to understand a portion of this power: how it is expressed in how people make sense of important experiences, and how to remedy this consequence.

Three Basic Motives Underlying Meaning Making
When there is room for interpretation, as there often is, what determines the meaning a perceiver comes up with? Social psychologists have identified three basic motives driving human meaning-making: The desires to be accurate, to think well of oneself, and to belong. Each insight has contributed to the development of effective interventions.

1. **Accuracy.** First, obviously there needs to be some correspondence between a person’s perception of the world and what is actually out there; if people lived in a complete fantasy world they would not survive for long. Infants attend to caregivers’ emotional reactions to assess the safety of a situation and behave accordingly (Sorce, Emde, Campos, & Klinnert, 1985). Attribution theory thus portrays people as reasonable information processors—lay scientists trying to make sense of their own and other people’s behavior as best they can (Heider, 1944; Jones & Davis, 1965; Kelley, 1967; Weiner, 1985).

However, even when people are trying to be accurate, they draw meanings from the world as it appears to them—from their perspective and social circumstance. Meanings are thus not just “in the head” but reflections of the external world (e.g., Gunderson et al., 2013). As a consequence, the same event can appear differently to people who have different experiences and vantage points, and this can lead to pejorative inferences. Students who face negative stereotypes in intellectual settings can reasonably interpret critical academic feedback as a sign of bias on the part of an evaluator (Cohen, Steele, & Ross, 1999). This interpretation is much less plausible for students who do not contend with a negative stereotype. Although they are in similar objective circumstances, they are in radically different psychological circumstances (Steele, 1997).

When meanings are detrimental—like those prompted by pejorative characterizations of the self (e.g., low self-esteem) or one’s group (e.g., stereotypes) or by toxic lay theories such as fixed theories of intelligence—people can get stuck in negative ways of thinking and acting that
become self-reinforcing. Many wise interventions aim to “unstick” these patterns and redirect people into more productive ways of viewing their circumstances. Thus representing critical feedback as given in an effort to help students meet a higher standard can cause lasting benefits for racial-minority students (Yeager, Purdie-Vaughns et al., 2014).

2. Self-Integrity. While people want their interpretations to be accurate, they are not disinterested observers of the world. The second basic motive of meaning making is that people want to think well of themselves—to believe they are adequate, moral, and competent (Aronson, 1968; Sherman & Cohen, 2006; Steele, 1988). An understanding of this need for “self-integrity” has led researchers to develop novel ways of helping people maintain a positive global self-image, which can improve functioning in the face of negative events (e.g., Cohen et al., 2009).

3. Belonging. The third basic motive arises from the fact that human beings are an inherently social species. Forming and maintaining positive social relationships and membership in valued social groups is one of our most important tasks from birth (Baumeister & Leary, 1995; Bowlby, 1988). We want to feel accepted and included by others, to belong to social groups, and to contribute positively to the lives of others. As a result, our interpretations of important aspects of world and behavior toward it are highly sensitive to how we think other people view and behave. Researchers have uncovered novel ways to leverage this need to belong to promote positive behaviors (e.g., Braga & Bond, 2008; Goldstein, Cialdini, & Griskevicius, 2008; Grant & Hofmann, 2011).

These three motives—to be accurate, to have self-integrity, and to belong—are not exhaustive; indeed, the precise characterization of basic motives and how they interact and keep each other in check is a matter of much discussion (e.g., Baumeister & Leary, 1995; Deci & Ryan, 2000; Heine, Lehman, Markus, & Kitayama, 1999; Pyszczynski & Greenberg, 1987;
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Steele, 1988; Swann, 1983; Weiner, 1985). For our purpose, what is most important is that each of the three motives described above has led to distinct types of interventions that we will review shortly.

Before discussing the principles of wise interventions, it is important to note how the three motives that underpin them were discovered and understood. The answer is with hundreds of carefully designed laboratory experiments. This foundational work has given rise to theoretical insights that allowed researchers to design interventions that never would have been conceived or attempted otherwise, such as the seemingly implausible idea that a short reflection on personal values would raise African American adolescents’ school achievement for years (Cohen et al., 2009). Indeed, one purpose of this paper is to illustrate how decades of theoretical work in social psychology—much of which seemed, at the time, to have little applied benefit—has blossomed into a theoretically-driven approach to help solve a wide array of personal and social problems.

III. Principles of Wise Interventions

Wise interventions attempt to change how people make sense of themselves and their social environment, interpretations driven by the three motives just discussed. Later we review specific strategies to effect such change. Here we discuss more broadly five principles inherent to wise interventions.

The term wise originates in the work of the sociologist Erving Goffman (1963), who used it to describe straight people who saw beyond the homophobia of the 1950s to recognize the full humanity of gay people. Later Steele (1997) described “wise schooling” as practices sensitive to the experiences of students who confront negative stereotypes in intellectual settings. Drawing on this tradition, we use wise to describe insight into how people make sense of themselves or a
situation they are in. Wise interventions are wise to the meanings and inferences people draw (Walton, 2014). They are characterized by the following principles.

1. Psychological Precision

Wise interventions aim to alter a specific interpretation to bring about positive change. They are thus not multifaceted “kitchen sink” reforms nor general programs, like a new tutoring service. Instead, wise interventions often operate within the context of existing programs.

For example, many students worry about whether they will belong when they enter a new school. Yet this worry is felt most acutely when students enter school settings in which their group is underrepresented and negatively stereotyped. In this circumstance, students can risk inferring from even commonplace challenges (e.g., feelings of loneliness, academic criticism), that they or their group does not belong in the school in general. To address this worry, the social-belonging intervention uses stories from older students to convey that worries about belonging are normal at first in a new school and improve with time. The intervention does not restructure the academic transition. Instead, this message helps students sustain a sense of belonging in the face of adversities and build peer and mentor relationships. As noted, in one study, African American students who received this intervention earned a higher college GPA over 3 years, halving the racial achievement gap (Walton & Cohen, 2011; see also Walton, Logel, Peach, Spencer, & Zanna, 2015; Yeager, Walton, et al., 2016).

A second intervention aimed to improve romantic relationships for people with low self-esteem. Doubting their own value, such people tend to dismiss compliments from partners, for instance as “just something she had to say” (Murray, Holmes & Collins, 2006; Murray, Rose, Bellavia, Holmes, & Kusche, 2002). To encourage people to see a compliment as truly reflecting a partner’s love, Marigold, Holmes, and Ross (2007, 2010) asked people in dating relationships
to recall a recent compliment from their partners. They then posed a single question, which assumed the compliment had a broad significance: “Explain why your partner admired you. Describe what it meant to you and its significance for your relationship.” As compared to simply recalling the circumstances of the compliment, this query led people with low self-esteem to feel more confident in their partner’s love immediately and, over the next several weeks, set in motion a cycle of more positive feelings and behaviors in both members of the couple, improving the relationship as a whole.

Both interventions precisely targeted self-reinforcing, negative interpretations and changed these in ways that led to a cycle of enduring improvement in psychology and behavior. This precision does not mean that wise interventions are simple; to effect change, wise interventions often rely on multiple processes, as we describe later, and involve a deep understanding of psychological processes and the context. But the target of this change is a specific meaning or inference.

The precision of wise interventions is important for both theoretical and applied reasons. First, it allows researchers to unambiguously identify the causal effect of a specific psychological process within a complex system. Wise interventions can thus shed light on psychological processes and their function within systems, contributing to theory. Second, precision can allow some kinds of wise interventions to be relatively brief and low-cost. And third, in targeting specific processes, wise interventions can provide a theoretical account of what approach will work with whom and in what context. Such an account is far more challenging for multifaceted reforms. When an intervention does many things at once, reformers may not know when or why the intervention works or does not work (see Kazdin, 2007).

For instance, wise interventions will work only in contexts that give rise to the relevant
psychological process (see the first row of Table 1, which illustrates contextual factors necessary for the effectiveness of wise interventions). People with high self-esteem generally need no inducement to view a compliment as having a broad meaning; they do not benefit from an intervention to bolster this confidence (Marigold et al., 2007). Interventions to mitigate the threat that arises from negative stereotypes (social identity threat) are generally effective only for students who face a negative stereotype in a school setting (Cohen et al., 2009; Walton & Cohen, 2011). They are also often most effective in settings in which the student’s group is underrepresented, where identity threat arises most acutely (Hanselman, Bruch, Gamoran, & Borman, 2014; Walton, Logel, et al., 2015). This does not mean that wise interventions cannot have broad, population-level effects. In many cases, many people face similar psychological circumstances and draw predictably similar meanings. In these cases, wise interventions can cause widespread benefits (e.g., Paunesku et al., 2015; Yeager, Walton et al., 2016).

As noted, the meanings people draw are not just “in the head” but typically reasonable inferences from the social world as it presents itself to a person. Understanding ideas and meanings as cycling from social contexts and into and out of minds (Markus & Kitayama, 2010; Markus & Conner, 2014) implies multiple points of entry for intervention. Thus it is possible both to alter teacher practice to represent critical feedback as intended to support students’ growth (Yeager, Purdie-Vaughns et al., 2014 Experiments 1 and 2) and to teach students to view critical feedback in general as motivated by an effort to promote learning (Yeager, Purdie-Vaughns et al., 2014 Experiment 3). The first approach alters how the world presents itself to a student; the second alters students’ lens for making sense of an important aspect of the world.

2. Understanding Psychological Processes as One Factor in Complicated Causal Systems
Although wise interventions target precise psychological processes, they are not myopic in this focus. Psychological processes do not exist in a vacuum but play a part in complex systems (Walton, 2014; Yeager & Walton, 2011). Thus in addition to theory about psychological processes, wise interventions involve theory about how a given process contributes to behavior or a social problem in the context of other forces (Lewin, 1947).

Most generally, for wise interventions to work there needs to be capacity for improvement in place. In general wise interventions remove psychological barriers to help systems function more efficiently (Lewin, 1947). In this sense, wise interventions are engine oil, not the engine. Engine oil doesn’t make the car run—the engine does. But engines need oil to perform optimally. Similarly, psychological interventions do not, on their own, improve achievement, health, or relationships. They rely on existing resources in people and systems and aim to help these function optimally to improve outcomes.

Thus wise interventions complement and do not replace the situational approaches to social reform mentioned earlier. Indeed, changing meanings can be critical to the success of such reforms. If students are struggling, a school may hire extra tutors, expanding students’ opportunities to learn. However, this expense may be wasted if students do not see struggle and setbacks as opportunities to learn (Lepper, Woolverton, Mumme, & Gurtner, 1993; Rattan et al., 2012; Yeager, Purdie-Vaughns, et al., 2014). In one illustrative study, experimentally varying the quality of instruction caused no improvement in how much struggling college students learned—unless they were first led to view struggles as challenges that could be overcome with effort and good strategies (Menec et al., 1994). In another, providing access to high-quality learning materials raised struggling elementary school students’ arithmetic performance (Bandura & Schunk, 1981). But when students were also encouraged to adopt proximal goals (“complete at
least 6 pages of instructional items per session”)—an addition designed to help students build self-efficacy—the improvement doubled. By the same token, structural reforms can be necessary for wise interventions to be effective. More oil won’t help an engine with a broken piston rod run (see Row B in Table 1).

Understanding psychological processes and structural factors as working in tandem provides a more nuanced understanding of school quality. When students fail to achieve, we often assume deficits in learning opportunities and aim to remedy these, such as by reducing class size, improving curricula, improving teacher training, or overhauling the entire school (e.g., charter schools, Fryer, 2012). When these reforms fall short, it is easy to blame inherent deficiencies in students, families, and/or communities such as a lack of critical cognitive (Herrnstein & Murray, 1994) or noncognitive skills (Duckworth & Seligman, 2005) or cultural values essential to success.

Yet an often overlooked determinant of student achievement is the psychological climate of a school (Steele & Cohn-Vargas, 2013; Tough, 2016). Many excellent schools are excellent precisely because they attend to students’ psychological experience (Martinez & McGrath, 2014). Conversely, when schools struggle it is important to ask if a psychological barrier prevents better outcomes. Indeed, wise interventions to remedy feelings of non-belonging, identity threat, or fixed mindsets about intelligence can cause large gains in achievement without expanding available learning opportunities (Yeager & Walton, 2011). These findings suggest that significant potential for greater learning and achievement exists in many students and many schools but is hidden and often goes unrealized as a consequence of psychological barriers (Coleman et al., 1966; Walton & Spencer, 2009). Remediying these barriers may be a crucial step to creating truly high quality school environments in which all students can learn and grow.
Because wise interventions operate within the context of complex systems they are organic to them unlike external impositions like a new program or artificial incentive scheme. Moreover, the psychological processes targeted by wise interventions are often implicit and not fully accessible to people (Nisbett & Wilson, 1977; Wilson, 2002). A consequence is that the effects of wise interventions can be relatively invisible to recipients. Suppose a psychological intervention causes lasting gains in students’ achievement. The student might attribute their success to their own hard work and the effective teaching they received, and rightly so. But they may not recognize how their learning was facilitated by a change in their interpretation of schooling. Although this invisibility may frustrate an intervener who wants to claim credit for an intervention’s success, it can allow recipients to take pride in their accomplishments rather than cede them to an external influence (McCord, 1978), potentially increasing effectiveness (Ross & Nisbett, 1991). Indeed, in some cases awareness of an intervention can undermine its effects especially if people feel the intervention is imposed upon them (Sherman, Cohen, et al., 2009), not a choice they made (Lyubomirsky et al., 2011; Perry et al., 2010; Silverman, Logel, & Cohen, 2013; Walton, Logel, et al., 2015).

Table 1. Classes of contextual factors necessary for wise interventions to apply in a setting and to be effective.

<table>
<thead>
<tr>
<th>Contextual Factors Important for the Effectiveness of Wise Interventions</th>
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<tr>
<td><strong>A.</strong> The targeted psychological process is present and undermines people’s functioning.</td>
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<tr>
<td><strong>B.</strong> Capacity for improvement is in place (e.g., in school, quality learning opportunities).</td>
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</tbody>
</table>
| **C.** The situation affords opportunities for a change in psychology to become embedded in the structure of people’s lives and can thus propel benefits forward in time (e.g., in school, better relationships that support greater success).  
  → Absent such affordances, an intervention may be effective in the short-term but not cause lasting benefits. |

3. Recursive Change in People and Situations

One of the most exciting aspects of wise interventions is their potential, in conjunction with the systems in which they are delivered, to improve the course of people’s lives long into
the future. This is because assumptions people make about themselves and social situations readily become self-fulfilling and embedded in the structure of their lives. In altering these assumptions, wise interventions can set in motion recursive cycles that propel gains forward in time or even make them “snowball” (Kenthirarajah & Walton, 2015; Rosenthal & Jacobson, 1968; Storms & McCaul, 1976; Yeager & Walton, 2011). From this perspective, lasting change does not reside only within the person, for instance in how people make sense of the world or their “character.” Nor is it restricted to a given situation which, once people exit, may lose its influence. Instead, change is represented as an ongoing pattern of transactions between the person and the social environment.

For example, when a student with a growth-mindset redoubles her efforts in response to a poor grade and improves on the next test, this may confirm in her mind the potential for growth, cause her teacher to invest more in her, and lessen her risk of entering a remedial track (Blackwell et al., 2007), each of which positions the student for greater future success.

Walton and Cohen’s (2007) social-belonging intervention offered students a narrative for making sense of early adversities like feelings of isolation or struggle in college as normal challenges that can be overcome. This change in interpretation helped socially disadvantaged students earn higher grades through the end of college (Walton & Cohen, 2011). Moreover, 3-5 years after college—7-9-years after the intervention—African American adults who had received the intervention in the first year of college reported greater life and career satisfaction—all the result of a one-hour session they attended in their first year of college. These gains were mediated not by recollections of the intervention experience but by reports of more substantive mentor relationships students developed with faculty during and after college (Brady et al., in prep B; see also Yeager, Walton, et al., 2016). In short, the intervention altered how students
made sense of early challenges in college. This empowered them to build positive relationships, creating a better social circumstance that facilitated greater success in life.

An important implication is that the long-term effects of wise interventions depend not just on the psychological process targeted by the intervention but on the *affordances* of the situation (Gibson, 1977): Does the situation afford opportunities for improvement such that an initial change in psychology can become embedded in people’s lives? Will a romantic partner respond positively to a positive overture? Can racial-minority students form strong relationships on campus? If not, lasting change is unlikely (see Row C in Table 1). Importantly, the degree to which a situation affords opportunities for improvement is not identical with its current quality. In some cases, even long-standing negative situations, such as repeated patterns of academic underperformance, can improve in response to a change in the psychology and behavior of a person.

Another implication is that the long-term effects of wise interventions may depend on timing. Often recursive processes are most amenable to change at the beginning of an experience, such as when students enter a new school when both meanings and patterns of social interaction are in flux and yet to be established (Cook et al., 2012; Raudenbush, 1984; Walton & Cohen, 2011; Wilson & Linville, 1982, 1985; Yeager, Walton, et al., 2016).

A third implication is that long-term effects may depend on whether people integrate a change in meaning in their lives. A risk of externally imposed, time-bound interventions is that a change in meaning may attenuate or even reverse when the intervention ends. In a tragic example, Schultz (1976) aimed to bolster a sense of control among retirement-home residents by allowing residents to control or to predict when a college student would visit them over two months. As compared to residents who received the same visits at random or no visits, residents
in the treatment conditions showed better health and well-being at the end of this period (e.g., rated as having more “zest for life”). But then the visits ended. At a 42-month follow-up, residents in the treatment conditions were rated as less healthy and were more likely to have died in the interim than those in the comparison conditions (Schultz & Hanusa, 1978). The intervention located a rich psychological idea—a sense of personal control—narrowly in a temporary situation limited to the study. Providing and then removing this sense of control was worse than not providing it at all. By contrast, another intervention aimed to bolster a sense of control in ways that nursing home residents could incorporate in their daily routines (e.g., to take care of a plant, when to go to a movie). This intervention appears to have caused short- and long-term benefits (although there are statistical and methodological questions about this study, Langer & Rodin, 1976; Rodin & Langer, 1977).

4. Methodological Rigor and Process

People cannot rigorously evaluate attempts to change their own and others’ behavior in their daily lives. A person fighting with a spouse does not have the luxury of comparing one strategy to a “no treatment” control group to see how well the strategy worked (and it would probably be poor form to tell your spouse that he or she is in the control group). But a scientific approach allows us to formally evaluate wise interventions in randomized field experiments, typically with thoughtful control conditions to remove obvious confounds.

The development of wise interventions typically starts small, often in laboratory research with the goal to clarify key processes, their nature, consequences, and malleability. Such research is usually inspired by qualitative work, past theory or laboratory experimentation, or other observations of the world (e.g., Steele, 1997). It then moves to small-scale field experiments, which aim to develop effective strategies for intervening in field settings, and to
examine how an intervention affects psychological processes and outcomes often over time. Usually this work involves a deep appreciation for the barriers a group of people face and the kind of change that would be most welcome. Starting small has advantages in terms of cost and efficiency, and limits the damage of any negative effect.

Once an intervention is better understood and shown to be effective in small-scale field trials, researchers may develop forms that can be delivered to larger numbers of people. At this stage, a critical question involves heterogeneity—in what kinds of contexts and with what kinds of people is the intervention effective or not and why: the robustness or generalizability of the intervention. These intersections may inform theory about social contexts and their opportunities and affordances as well as theory about the intervention and psychological processes (see Weiss, Bloom, & Brock, 2013).

When an intervention is delivered in a highly scalable way to large and diverse samples, we may generally anticipate smaller effect sizes than when it is precisely tailored for and hand-delivered, so to speak, to a more homogenous population (Paunesku et al., 2015; Yeager, Romero, et al., 2016). Yet when an intervention can be scaled at low cost (e.g., through online modules), the critical question may be not its relative but its absolute effectiveness (e.g., Bond et al., 2012). Low-cost exercises that benefit only some people but can reach many people can be very valuable. Growth-mindset interventions provide a model of this process, from laboratory studies (e.g., Mueller & Dweck, 1999) to small-scale field trials (Aronson et al., 2002; Blackwell et al., 2007; Good et al., 2003) to large-scale field trials (Paunesku et al., 2015; Yeager, Romero, et al., 2016) to publicly available resources (e.g., https://www.mindsetkit.org/).

The strategy of starting small and scaling up contrasts with the manner in which many social reforms are implemented, namely widely before rigorous testing. Sadly, once programs
are tested with randomized controlled trials, many turn out to be ineffective or to cause harm (e.g., Scared Straight programs designed to reduce teenage violence; the D.A.R.E. anti-drug program; infant simulator programs designed to reduce teenage pregnancy by giving teens a make-believe infant to care for; Brinkman et al., 2016; Wilson, 2005, 2011). Instead, the systematic development and evaluation of wise interventions mimics the development of medical interventions (e.g., new drugs). Innovation, theory development, and rigorous evaluation take place at each step. However, the primary questions addressed at each stage differ, from the nature of a psychological process (laboratory research), to intervention methods and effects over time (small-scale field trials), to scaling and heterogeneity (large-scale field trials). This process informs fundamental questions about psychological processes, methods of intervention, intersections with social contexts, and the bases of social problems.

5. Ethical Considerations

Wise interventions address core aspects of people’s lives, including their health, well-being, achievement, and relationships. Yet like a powerful garden hose, psychological interventions can go awry. They can have unpredicted effects, negative effects, or effects that can be positive in some respects but negative in others (Schulz & Hanusa, 1978; Silverman, Gwinn, & Van Boven, 2015). Thus it is essential from an ethical viewpoint as well as a practical and scientific one to conduct rigorous tests of the effectiveness of an intervention and the soundness of the theorizing that prompted it, as well as to identify any potential negative consequences even if for a minority of recipients.

An additional important reason to take a formal, scientific approach is to make explicit the psychological and behavioral changes prioritized by a reform and to identify any tradeoffs. Often the changes promoted by wise interventions are endorsed by all concerned (e.g., better
health, higher achievement, greater well-being). Some cases, however, raise competing values (e.g., Shook & Fazio, 2008). For example, broken-windows policing—which aims to instill norms of order by cleaning up physical signs of disorder and strictly enforcing quality of life crimes like loitering (Wilson & Kelling, 1982)—may reduce crime (Braga & Bond, 2008) but increase the harassment of racial minorities (Department of Justice, 2016; Ridgeway, 2007). In bringing such tradeoffs to light, a scientific approach can promote a more informed debate, such as how to achieve benefits without incurring costs. This approach can also help identify common practices that cause harm, such as demographic queries immediately before standardized tests, which can exacerbate identity threat and achievement gaps (Danaher & Crandall, 2008).

Wise interventions can also raise specific concerns. First, attempts to change private beliefs and behavior may make some people uncomfortable. Yet such attempts are ubiquitous in social life, from marketing to personal communications to social policy. People routinely try a new strategy to motivate a student, to address a personal conflict, or to encourage people, say, to quit smoking. Such “everyday” efforts are inevitable as people pursue their goals. The question is thus not whether to deliver psychological interventions but how to do it well—effectively and responsibly.

The problem with everyday interventions is that often they are based on a poor understanding of human nature. They rely on lay theories about psychology or “common sense.” Common sense is not always wrong, of course, but it often leads to interventions that are ineffective or do more harm than good (Wilson, 2011). In medicine, relying on common sense can produce disastrous results. Fortunately, most people recognize the limits of their knowledge about disease and heed advice from physicians and other experts. But when it comes to “treating” psychological processes that give rise to problems of social life—that make people
unhappy or struggle in school or prolong conflicts—lay people and policymakers alike often rely on “home remedies” that are no more effective than blood-letting is in curing disease.

Wise interventions, by contrast, leverage precise theory with good intentions to help people flourish. They are evaluated using experiments including to identify possible harms and to keep these good intentions and theory in check. Upon such evaluations, institutions and society at large can choose to implement those interventions at scale if they align with commonly agreed-upon goals and have adequate evidence. In these ways, wise interventions are more likely to be effective than counterfactuals; they do not change too many factors at once and are therefore less intrusive than other reforms; and they help decision-makers make more informed decisions.

Finally, people can think that wise interventions fault people for having unproductive ways of thinking, “blaming the victim” and reducing social problems to personal failures (see Ikizer & Blanton, 2016). This is a misperception. As we have seen, people’s views generally reflect reasonable inferences about the world from their perspective. People do not just choose how to think about important aspects of the world, and cannot easily “snap out of” bad ways of thinking. Wise interventions help people reinterpret their circumstances in ways that are often difficult to do on their own to bring about changes in their lives consistent with their goals.

IV. Strategies and Types of Wise Interventions

How do wise interventions change how people make sense of themselves and their circumstances? Here we review specific strategies. We then organize wise interventions into three families, which target different motives of meaning-making.

Overview of Strategies to Encourage Change

Unlike learning a new skill (like calculus or self-control), efforts to change the meaning
people ascribe to themselves and social experiences generally do not involve practice or repetition; more is not necessarily better. To change how people view their self-identity, make sense of how a romantic partner regards them, or decide whether they belong in a difficult math class, mere repetition of some mantra is unlikely to be effective (like Stuart Smiley: “I’m Good Enough, I’m Smart Enough, and Doggone It, People Like Me!”, or Bart Simpson writing on the blackboard: “I’ll be good. I’ll be good. I’ll be good…”). Rather, wise interventions use strategies honed in basic research to offer people constructive new meanings and attributions in compelling ways.

Typically wise interventions aim to be minimally directive. They offer people new information, place them in new situations, or give them well-designed reflection exercises, and then allow people to draw new conclusions on their own. This wisdom follows a guiding principle of social psychology beginning with dissonance theory (Festinger & Carlsmith, 1959): Influence attempts are most effective when they lead people to internalize or “own” the relevant change. Indeed, direct efforts to change people’s beliefs can seem controlling, stigmatizing, or irrelevant and if so are unlikely to be taken to heart (Brehm, 1966; see Sherman, Cohen et al., 2009), especially among adolescents and adults (Yeager, Fong, Lee, Espelage, 2015; Yeager, Trzesniewski, & Dweck, 2013), and people in cultures that prize personal independence (Markus & Kitayama, 1991). Thus wise interventions generally do not tell people that they “should” adopt a new belief but allow them to adopt it on their own (see Brady et al. 2016; Silverman et al., 2013; Walton, Logel, et al., 2015).

Four broad types of change strategies have been used successfully: (1) direct labeling, (2) prompting new meanings, (3) increasing commitment through action, and (4) active reflection exercises. Below we describe each at a high level. Later, in describing the three families of wise
interventions, we use specific examples to illustrate each strategy.

1. **Direct Labeling.** A classic study found that twice as many people cooperated when a prisoner’s dilemma activity was labeled “the Community Game” than when it was called “the Wall Street Game” (Liberman, Samuels, & Ross, 2004). A direct approach to intervention is to provide people a positive label that defines an otherwise ambiguous aspect of themselves, a social situation, or other people. This can motivate people to behave in accordance with the label (self-labeling: Miller, Brickman, & Bolen, 1975; situation-labeling: Goldstein et al., 2008; labeling of others: Rosenthal & Jacobson, 1968). Directly labeling an aspect of the self, however, can be more effective with children than adults, who may have more established self-views and may react against messages that appear coercive. Additionally, direct labels can backfire if they imply that a personal quality is fixed, not an area in which people can grow. Thus telling children “You’re so smart” can undermine their resilience to setbacks (Mueller & Dweck, 1998).

2. **Prompting New Meanings.** Many wise interventions give people a basis for drawing a new inference but do not provide the inference itself. Doing so can prompt people to reconsider how they think about themselves, others, or a situation—to revise their implicit “stories”—without directly telling them what to think (Wilson, 2011). As we will see, prompting can be accomplished by altering situations, providing new information, or asking questions that imply new meanings (e.g., situations: Braga & Bond, 2008; Redelmeier et al., 2003; information: Blackwell et al., 2007; Wilson & Linville, 1982; questions: Bryan, Walton, Rogers, & Dweck, 2011; Marigold et al., 2007, 2010).

3. **Increasing Commitment Through Action.** Other interventions use strategies developed in research on cognitive dissonance to actively engage people in committing to a new idea (Aronson, 1968; Festinger, 1957). When people experience tension between their behaviors
and attitudes, they are motivated to resolve this tension, and often do so by revising their attitudes to accord with their behavior. Thus creating situations that inspire people to freely act in line with a new belief can cement psychological change. A number of studies, for example, have made good use of the *saying-is-believing* approach (Aronson, 1999). People receive new information that supports a key idea. Often this idea is presented as intuitive and one they already endorse. They are then asked to explain this idea to others, often in a letter of advice to younger or less experienced people than themselves using examples from their own experience. Compared to simply providing people with information, this (1) encourages people to think about an idea actively rather than to just receive it passively, promoting learning; (2) treats them as co-creators of an effort to help others, leveraging prosocial motivations (Yeager, Henderson, et al., 2014), rather than as recipients of an intervention, a potentially stigmatizing role (Alvarez & van Leeuwen, 2015; Yeager, Romero, et al., 2016), or as recipients of a persuasive appeal, which could be rejected; (3) allows people to advocate for an idea, increasing its persuasive appeal (Festinger & Carlsmith, 1959); and (4) helps people connect an idea to their own lives and thus to personalize and take ownership of it, allowing standardized materials to speak to people with diverse experiences. Interventions that include saying-is-believing procedures have yielded some of the largest and longest-lasting gains observed in the literature, including some growth-mindset interventions (Aronson et al., 2002; Paunesku et al., 2015), some attributional-retraining interventions (Wilson & Linville, 1985), social-belonging interventions (Walton & Cohen, 2011), theory-of-personality interventions (Yeager, Johnson, et al., 2014), some wise-feedback interventions (Yeager, Purdie-Vaughns et al., 2014, Experiment 3), prosocial-purpose interventions (Yeager, Henderson, et al., 2014), and empathic-discipline interventions (Okonofua, Paunesku, & Walton, 2016).
Later we discuss other commitment strategies derived from dissonance theory (e.g., hypocrisy, counterattitudinal behavior).

**4. Active Reflection Exercises.** A variety of exercises help people reframe problems, often through writing. These exercises are distinct in that recipients are not provided new information or asked to change their behavior in any way. Rather, they are instructed to write in an open-ended manner in ways that help them reinterpret events on their own. An example is value-affirmation exercises, which aim to mitigate psychological threat by reconnecting people with core personal values (Cohen et al., 2009). Others help people reexamine negative events, which can help people find resolution or new meaning and forestall maladaptive ruminative thoughts to improve health and well-being (e.g., Finkel et al., 2013; Kross & Ayduk, 2011; Pennebaker, 1997; Ramirez & Beilock, 2011).

Each change strategy can help people reinterpret themselves and a social situation. There are differences among them, though, and some are better designed to change some kinds of meanings than others—as we will now see.

**Three Families of Wise Interventions**

All wise interventions capitalize on the foundational insight reviewed earlier—that how people make sense of themselves and their situation is a primary determinant of behavior. Interventions vary, however, in which of the three motives for meaning-making they emphasize—the need to be accurate, the need for self-integrity, or the need to belong. While the resulting families of intervention overlap, they also illustrate distinctive approaches to helping people flourish. Here we outline theoretical principles relevant to each psychological process and illustrate each family and relevant strategies for change with examples. Table 2 summarizes the intersection between families of wise interventions and change strategies. Some cells are blank
simply because research has not (yet) shown the relevant change strategy to alter the relevant psychological process. Extensive examples of interventions targeting each process are provided in Supplementary Tables 1-3.¹

**Table 2. What to change and how to change it.** Three families of psychological processes targeted by wise interventions and a sample of strategies to change them.

<table>
<thead>
<tr>
<th>Change Strategy</th>
<th>Family of Wise Intervention</th>
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<tbody>
<tr>
<td></td>
<td>The Need to be Accurate</td>
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<tr>
<td></td>
<td>Need for Self-Integrity</td>
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<td></td>
<td>Need to Belong</td>
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<td>Direct Labeling</td>
<td>• Identity labeling</td>
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<td></td>
<td>• Labeling of other people’s potential</td>
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<tr>
<td></td>
<td>• Explicit social normative appeals</td>
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<tr>
<td></td>
<td>• Other explicit social information, e.g., that represents a behavior as an opportunity to help others</td>
</tr>
<tr>
<td>Prompting New Meanings</td>
<td>• Alter situation to imply new meanings</td>
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<td></td>
<td>• Provide new information to imply new meanings</td>
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<tr>
<td></td>
<td>• Leading questions</td>
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<tr>
<td></td>
<td>• Alter social situation to prompt new inferences about what is normative</td>
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<tr>
<td></td>
<td>• Provide new social information (e.g., stories) that suggests new norms</td>
</tr>
<tr>
<td>Increasing Commitment</td>
<td>• Saying-is-believing</td>
</tr>
<tr>
<td>Through Action</td>
<td>• “Do Good, Be Good”</td>
</tr>
<tr>
<td></td>
<td>• Saying-is-believing</td>
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<td></td>
<td>• Hypocrisy</td>
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<td></td>
<td>• Effort justification</td>
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<td></td>
<td>• Counter-attitudinal behavior</td>
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<td></td>
<td>• Personal commitment</td>
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¹ We hope that future scholarship will extend these tables to provide a systematic up-to-date resource for the field. Examples are culled from numerous searches, including a September 2016 PsychInfo search combining “intervention” with diverse science and psychology journals (Child Development, Personality and Social Psychology Bulletin, Proceedings of the National Academy of Sciences, Psychological Science, Journal of Applied Psychology, Journal of Applied Social Psychology, Journal of Experimental Psychology: Applied, Journal of Experimental Psychology: General, Journal of Experimental Social Psychology, Journal of Personality and Social Psychology, Journal of Educational Psychology, and Science). Many references were also obtained from prior empirical and review articles. We retained studies that (1) featured one or more psychologically precise independent variables (i.e., interventions), which (2) addressed subjective meaning-making; (3) assessed real-world behaviors, attitudes, or emotions of inherent importance to the person and/or society (this excluded studies that assessed only behavioral intentions, or behavior, attitudes, or emotions in response to a stimulus presented in a laboratory context); and (4) were evaluated in randomized controlled trials to test causal effects. This review prioritized novel psychological processes; thus some studies that replicate and extend other interventions are included as “see also.”
Interventions that Capitalize on the Need to be Accurate

As noted earlier, even when people are trying to draw accurate inferences about themselves and the social world, they can get stuck in maladaptive ways of thinking that become self-reinforcing and ultimately cause profound personal harm. A college student who attributes a bad grade to her lack of intelligence will find it difficult to study for the next test, ensuring another poor grade and confirming her pejorative view. Many wise interventions aim to help people reinterpret their circumstances in less pejorative ways drawing on attribution theory (Storms & McCaul, 1976; Valins & Nisbett, 1971; Wilson, Damiani, & Shelton, 2002). Importantly, these approaches are concerned more with helping people come up with nonpejorative interpretations, regardless of whether these interpretations are accurate in some objective sense (Abramson, Seligman, & Teasdale, 1978). But they do so by capitalizing on people’s desire to form accurate views, by assuming that people are motivated to see the world as it is and are thus open to information that suggests new views.

**Direct Labeling.** The most direct approach is to tell people about themselves or others. For instance, 5th graders told they were “litter-conscious” littered less than students given persuasive appeals not to litter, as long as 7 weeks later (Miller et al., 1975). Telling teachers that certain students are likely to “bloom” can facilitate teaching that gives rise to greater academic growth in students (Rosenthal & Jacobson, 1968; see also Raudenbush, 1984).

**Prompting New Meanings.** Many interventions prompt new meanings indirectly, by leading people to a new inference.
**Altering situations.** Changing situations can be a powerful way to prompt new meanings. One example involves a heuristic people use to evaluate past experiences: People tend to place disproportionate weight on how the experience ended. Thus improving the end of an experience can improve later assessments of it (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993). Leveraging this insight, one intervention prolonged colonoscopies by leaving the colonscope inside patients’ rectums at the end of the procedure and then withdrawing it slowly. Although people experienced pain for longer and more pain in total, this reduced the pain they experienced at the end. In turn, patients recalled the experience as less painful as a whole, and were 41% more likely to agree to another colonoscopy an average of 5 years later if needed (Redelmeier et al., 2003).

Changing situational cues can be especially important when people’s processing capacity is limited. Alcohol is commonly believed to make people more risk-seeking but, in fact, it narrows people’s attention to the immediate situation and thus makes proximal cues more impactful (Steele & Josephs, 1990). Drinkers can thus be risk-seeking in settings that encourage risky behavior but especially risk-averse when cues discourage risk. Taking advantage of this process, one study had undergraduates view a safe-sex video and, in one condition, also gave them a bracelet and asked them to remember the dangers of unsafe sex whenever they looked at it (Dal Cin, MacDonald, Fong, Zanna, & Elton-Marshall, 2006). Five to seven weeks later, undergraduates reported on their last sexual experience. Among those who had not been drinking when they had sex, 46% given the bracelet reported having used a condom, as compared to 25% who just saw the safe-sex video. Among those who had been drinking, however, the benefit was even larger: 71% in the bracelet condition used a condom, versus 36% who just saw the video. A third group that saw no video and received no bracelet was indistinguishable from students in the
safe-sex video condition. Thus reminding students of the dangers of unsafe sex had no effect—unless they carried a token of this reminder with them into situations in which they might have unprotected sex, which could change the meaning of this act and relevant behavior.

**Providing information.** Many interventions provide information that leads people to a new inference. In school, students can risk inferring that struggles reflect internal deficiencies, a self-defeating attribution, rather than factors they can control or that improve with time. Although there has been some success with direct attempts to change students’ attributions (Perry & Hamm, in press), most interventions prompt adaptive attributions indirectly, such as by sharing stories of challenges older students experienced and how these improved with time (e.g., Stephens et al., 2014; Wilson et al., 2002; Wilson & Linville, 1982) or by providing information about how intelligence is not fixed but can grow with effort and good strategies (Blackwell et al., 2007).

**Leading Questions.** Another approach is to ask questions that imply a new inference. We have already seen several such interventions, for instance to help people interpret a compliment from a relationship partner as having a global meaning (Marigold et al., 2007, 2010) or to interpret difficulties with a baby as not evidence that the child is “a bad baby” but as a normal problem to be solved (Bugental et al., 2002). Another leading-question intervention raised grades in high school science. Students were asked to write several times over a semester about how course material might be relevant or useful to them or someone they knew (Hulleman & Harackiewicz, 2010). Importantly, the question assumed this relevance, and prompted students to justify and expound upon this. Notably, just telling students that academic material is useful may not produce the same benefits, especially if the reasons given are less relevant to a person or if doing so increases pressure and reduces confidence (Canning & Harackiewicz, 2015).
Another study used leading questions to tie voting to the self-concept (Bryan et al., 2011). The day before two major elections, people were asked survey questions about voting (e.g., “How important is it to you to vote in tomorrow’s election”) or about being a voter (e.g., “How important is it to you to be a voter in tomorrow’s election”) (italics added). The latter wording, which encouraged people to see voting as having stakes for their identity, produced one of the largest increases in voter turnout ever observed.

Leading questions can also prompt people to plan how to organize their behavior to accomplish their goals, termed implementation intentions (Gollwitzer, 1999). In a classic study, a fearful message about tetanus had no effect on the likelihood that college seniors went to a clinic to get a tetanus shot (Leventhal, Singer, & Jones, 1965). But asking students to review their schedule to find a convenient time raised the percentage of students who got the shot from 3% to 28%. Students did not need more motivation to get the shot. They needed to turn this goal into a plan. Another study randomized a mailer sent to more than three thousand employees announcing free flu shot clinics (Milkman, Beshears, Choi, Laibson, & Madrian, 2011). When the flier asked people to “make a plan” and what day and time they would come, vaccination rates rose from 33% to 37%.

**Increasing Commitment Through Action.** An effective way to change people’s beliefs is to change their behavior first. As long as people view their behavior as freely chosen and not coerced, they may infer that their beliefs are in accord with their actions (Bem, 1972). In a program called Teen Outreach, for example, high school students are asked to perform volunteer work in a community agency of their choice over the school year. Students randomly assigned to this program, versus those who do not take part, do better in school and are less likely to become pregnant or get someone pregnant (Allen, Philliber, Herrling, & Kuperminc, 1997). One way the
program works is by increasing teens’ sense of autonomy and their connection with their community. That is, students’ self-views change to be consistent their actions (volunteering).

Many interventions combine new information with saying-is-believing, to encourage people to commit to a new idea and to help them connect it to their own lives. Aronson and colleagues (2002), for instance, delivered a growth-mindset of intelligence intervention by asking college students to write letters of advice to struggling middle school students describing the value of a growth mindset. This raised the college students’ semester grades (see also Okonofua et al., 2016; Paunesku et al., 2015; Walton & Cohen, 2011; Wilson & Linville, 1985). Illustrating the benefits of this approach, one growth-mindset intervention was more effective when 9th grade students were told that the exercise was designed to solicit their expertise to help future students than when told it was designed to help them (Yeager, Romero, et al., 2016).

**Active Reflection Exercises.** Written reflection exercises can help people reconstrue negative events. In a seminal study, Pennebaker (1997) showed that having students write concretely about troubling and even traumatic experiences improved health (e.g., fewer visits to the medical center) and well-being. Writing may help clarify the nature and limits of a negative experience, bringing unproductive ruminative thoughts to a close. Subsequent investigators have used more directive exercises to maximize benefits (see Ramirez & Beilock, 2011). For example, Kross and colleagues (2014) asked people to write about a negative event from a third-person perspective, as if they were a fly on the wall observing it, and to explain why the event occurred the way it did. Compared to people who wrote about the event from a first-person perspective (e.g., “I failed a test”), those who adopted the third-person perspective (“Greg failed a test”) were more likely to interpret the event in a non-pejorative way, to stop ruminating on it, and to experience less psychological distress (see also Kross & Ayduk, 2011; Kross et al., 2005; Park,
Ayduk, & Kross, 2015). As described earlier, Finkel and colleagues (2013) asked married couples in three 7-minute writing exercises over a year to consider how “a neutral third party who wants the best for all” would think about a conflict in their marriage, barriers to them taking this perspective, and how they could overcome these barriers to take this perspective in future conflict situations. This halted the typical decline in marital satisfaction over a year.

Some implementation-intention interventions also use writing exercises. For example, in mental contrasting with implementation intentions, people write about a goal they want to achieve, obstacles that might prevent them from achieving this goal, and how they can overcome these obstacles. This can increase the likelihood that students succeed academically and in other domains (Duckworth, Kirby, Gollwitzer, & Oettingen, 2013; see also Morisano, Hirsh, Peterson, Pihl, & Shore, 2010; Oettingen, 2012).

**Summary.** These strategies capitalize on people’s motivation to make sense of themselves or their circumstances in accurate ways. In some cases recipients are relatively passive, such as when they receive subtle prompts that imply a new way of viewing a situation. Others require active engagement, such as saying-is-believing and active reflection exercises, but this may make them more engaging and increase the likelihood people will personalize the idea conveyed.

**Interventions that Capitalize on the Need for Self-Integrity**

As noted earlier, people have a strong desire to see themselves as adequate, moral, and competent. Experiences that threaten this sense of self-integrity can give rise to a range of personal and social problems (Aronson, 1968; Sherman & Cohen, 2006; Steele, 1988). To address these problems, many interventions aim to reduce psychological threats. Others create circumstances in which people will feel inconsistent or hypocritical if they do not behave
positively, effectively leveraging motivations for self-integrity to instigate positive behavior (see Table 4).

**Remedying Threats to Self-Integrity Through Value-Affirmation Writing Exercises.** People routinely experience psychological threats, from information that a habit (e.g., smoking) imperils one’s health; to an upcoming test one might fail; to a stereotype that casts one in a negative light; to a personal conflict. In addition to challenging a specific aspect of the self, such as the perception of oneself as healthy, events like these can undermine a person’s desired view of themselves as good, moral, and competent in general (Sherman & Cohen, 2006; Steele, 1988). This broad threat to self-integrity can increase stress, undermine well-being, and lead people to act in maladaptive or self-destructive ways, such as to deny the validity of health risk information (Sherman et al., 2000).

To help people function more effectively, value-affirmation interventions provide people a way to reflect on enduring positive aspects of themselves so as to bolster their global sense of self-integrity (Sherman & Cohen, 2006; Steele 1988). In a classic exercise, people review a list of values (e.g., relationships with friends and family, artistic ability), identify a value that is most important to them, and then describe why. This is not hollow self-esteem boosting. Value affirmations do not build people up with false praise or facilitate exaggerated self-views. Rather, reflecting on personal values of enduring importance helps focus people on ways they are worthy, competent people in important areas of their lives beyond that which is threatened. In so doing, value affirmations “lower the heat,” place a specific threat in a broader context, reduce stress, and help people respond in more effective, less defensive ways (Cohen & Sherman, 2014; Critcher & Dunning, 2015; Sherman & Cohen, 2006; Sherman & Hartson, 2011; Walton, Paunesku, & Dweck, 2012). Moreover, because threat and suboptimal responses often become
self-reinforcing—threat undermines functioning, further increasing threat—a greater sense of psychological safety can cause enduring benefits (Cohen et al., 2009).

Some of the most powerful benefits of value-affirmation interventions involve its effects in reducing social identity threat, mitigating educational inequality. The worry that one could be viewed through the lens of a negative stereotype can heighten anxiety and distraction and, ironically, make it harder to perform well (Steele, 1997, 2010; Steele, Spencer, & Aronson, 2002; Schmader, Johns, & Forbes, 2008; Walton & Spencer, 2009). Following basic laboratory research (Martens, Johns, Greenberg, & Schimel, 2006), seminal field experiments found that African American adolescents who completed value affirmations as in-class writing exercises at the beginning of 7th grade earned higher course grades that semester, reducing race differences by 40%, as well as reduced accessibility of negative stereotypes (Cohen et al., 2006). These academic benefits persisted through 8th grade, with the greatest benefits for initially low-performing African American students who may otherwise experience the most severe cycle of threat and poor performance (Cohen et al., 2009). The long-term gains seem to arise in part because students who feel psychologically safe in school are better able to develop a secure sense of belonging (Cook et al., 2012; see also Brady et al., 2016; Layous et al., 2016; Sherman et al., 2013). Six years after the original intervention, African American students who had completed the affirmation exercises were more likely to enroll in college (92% versus 78%; Goyer, Garcia et al., under review; for scaling studies, see Borman, Grigg, & Hanselman, 2016; Dee, 2015; Hanselman et al., 2014).

In college samples, affirmation interventions have raised women’s performance in male-dominated science and engineering fields, eliminating gender differences (Miyake et al., 2010; Walton, Logel et al., 2015); raised biology grades among first-generation college students,
eliminating social-class differences (Harackiewicz et al., 2014; Tibbetts et al., 2016); and raised GPA among Latino American students over two years (Brady et al., 2016). In each case, students who faced identity threat in the context benefited most.

Value affirmation can also reduce threats that arise from sources beyond negative stereotypes, including to increase acceptance of the health risks of smoking (Harris et al., 2007) and excess drinking (Armitage, Harris, & Arden, 2011) and reduce drinking (Armitage et al., 2011); to reduce physiological stress as a major exam approaches (Sherman, Bunyan, Creswell, & Jaremka, 2009); to increase the ability to self-regulate to accomplish goals on laboratory tasks (Schmeichel & Vohs, 2009) and, in field settings, to promote weight loss over several months (Logel & Cohen, 2012); and to improve interpersonal behavior and relationships over periods up to several months among narcissistic adolescents (Thomaes, Bushman, Orobio de Castro, Cohen, & Denissen, 2009), antisocial adolescents (Thomaes, Bushman, Orobio de Castro, & Reijntjes, 2012) and socially insecure college students (Stinson, Logel, Shepherd, & Zanna, 2011).

**Leveraging Motivations for Self-Integrity: Increasing Commitment Through Action.** Whereas value affirmations aim to remedy threats to self-integrity, other interventions leverage motivations for self-integrity to promote positive behavior (Table 4). Typically they create circumstances that lead people to view positive attitudes or behavior as important to being a good and coherent person.

**Table 4.** Two ways to address needs for self-integrity and to belong to produce positive change.

<table>
<thead>
<tr>
<th>Motivational System</th>
<th>The Need for Self-Integrity</th>
<th>The Need to Belong</th>
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<tbody>
<tr>
<td>Strategy</td>
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<tr>
<td>Remedy Threat that Undermines Functioning</td>
<td>• Value-affirmation interventions</td>
<td>• Facilitate a sense of social connection when this connection is lacking</td>
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<td></td>
<td></td>
<td>• Challenge salient negative social norms</td>
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<td></td>
<td></td>
<td>• Represent social adversities as temporary and improveable</td>
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</table>
**Hypocrisy.** One approach is to create circumstances in which positive behavior helps people resolve a sense of personal hypocrisy. In a variation of the “saying-is-believing” technique, college students were asked to advocate for safe-sex practices to high school students and, in addition, and were made to feel hypocritical by recalling times they did not practice safe sex themselves. As compared to either students who only advocated for safe sex (who can see themselves as exemplary) or who only recalled their own inconsistent past practice (who can see unsafe sex as not a big deal) but did not do both, those in the hypocrisy condition subsequently purchased more condoms (Stone, Aronson, Crain, Winslow, & Fried, 1994).

Another study used hypocrisy to promote positive intergroup attitudes during the Civil Rights movement. Undergraduates were asked to rank-order personal values, and learned that peers tended to rank “freedom” more highly than “equality” (Rokeach, 1971). The researcher suggested that this meant “students, in general, are much more interested in their own freedom than…in the freedom for other people” (p. 454). Students were then asked about their support for and participation in civil rights demonstrations. The researcher suggested that both students who opposed civil rights and students who said they supported civil rights but had not demonstrated “care a great deal about their own freedom but are indifferent to other people’s freedom.” As long as 15-17 months later, this induction of hypocrisy led students to value “equality” more highly and to endorse civil rights more strongly. Moreover, treated students were more likely in
the interim to respond to a solicitation from a civil rights organization, the NAACP (26% versus 11% in the control condition) and to enroll in an academic program in intergroup relations (42% versus 22%), suggesting both the behavioral consequences of the intervention and the recursive processes that may sustain its effects.

**Counter-attitudinal behavior.** Another strategy is to create a circumstance that motivates people to freely act in ways that contradict a problematic attitude; this can motivate people to revise the attitude (Festinger & Carlsmith, 1959). One study led Asian and White students to feel socially connected to a Mexican-American peer, disposing them to share her interests including her cultural interests, and also invited students to work with this peer on a Mexican cultural activity, designing a music video for a Mexican band she liked (Brannon & Walton, 2013). After doing so, students showed lower levels of implicit prejudice against Latinos and, six months later, reported greater interest in talking with Mexican American peers and more positive attitudes toward undocumented Mexican immigrants. These gains were found relative to students who worked with the peer to design a video for a non-Mexican band and students required to design the video for the Mexican band—that neither group freely took part in a Mexican cultural activity, which could seem inconsistent with prejudice against Latinos. They were also found relative to students not led to feel socially connected to the Mexican-American peer, who did not engage as enthusiastically with the cultural task.

**Commitment.** A third strategy is to create a context that encourages people to freely commit to a future behavior, increasing the odds people will follow through because not doing so would appear inconsistent. In a classic demonstration, 94% of beach-goers asked to watch another person’s belongings chased down an accomplice who attempted to steal a radio, as compared to 20% not asked (Moriatry, 1975). A classic intervention used small group
discussions to encourage housewives to serve cheap organ meats to their families during the meat shortages of World War II (Lewin, 1947). Although the intervention included multiple wise elements, an important feature was that the facilitator asked women at the end of the discussion to indicate by a show of hands who would serve organ meats to their families over the next week. This increased the percentage who did from 3% to 32%. A recent application found that placing the signature line at the top rather than the bottom of a car insurance form—thus making people commit to truth-telling before completing the form—led motorists to disclose having driven 10% more miles (26,098 vs. 23,671), increasing payments and promoting fairness (Shu et al., 2012; for a qualification, see Gollwitzer, Sheeran, Michalski, & Seifert, 2009).

**Backfires.** The fact that it is possible to both reduce threat to self-integrity to improve functioning and to leverage motivations for self-integrity to promote positive behavior means that interventions in this space can backfire. Attempting to reduce threat when threat is what motivates positive behavior, or to leverage motivations for self-integrity when self-integrity is already under threat, may be counterproductive. Indeed, when people are failing, value-affirmation can lead people to disengage from goals, in part by allowing them to accept that they are bad at a task (Vohs, Park, & Schmeichel, 2012). If one reason students stay in a remedial college math program despite struggles is because inferring that they are bad at school would undermine their sense of being a good person, exercises that satisfy this need could undermine persistence.

Thus interventions that contend with the need for self-integrity should, in particular, proceed with care and rigorous evaluation. In general, it may be helpful to leverage motivations for self-integrity when people do not place adequate value on a behavior, increasing its importance by linking it to core concerns of the self. However, when people already value
relevant goals, as is often the case, it is important to ask whether progress toward these goals is stymied by chronic threats to self-integrity.

**Interventions that Capitalize on the Need to Belong**

Like interventions that address the need for self-integrity, interventions that address belonging can either remedy threats that undermine functioning or leverage this motivation to instigate positive behavior (Table 4).

**Remedying Threats to Belonging.** Several interventions aim to foster or protect a sense of social connectedness among people for whom social relationships are otherwise at risk.

**Prompting new meanings.** Receiving periodic caring notes from a hospital following a suicidal or depressive incident can reduce suicide rates over several years (Motto & Bostrom, 2001; see also Carter et al., 2013). Illustrating the meaning these notes can have for people, one former patient replied, “You will never know what your little notes mean to me. I always think someone cares about what happens to me, even if my family did kick me out. I am really grateful” (Motto & Bostrom, 2001, p. 832).

In other cases, worries about belonging can lead people to behave in maladaptive ways; this can be remedied with new social information. One cause of excess college drinking is that students overestimate the prevalence of and comfort with drinking among peers, which can motivate them to drink more to fit in (Prentice & Miller, 1993). When students’ misperceptions are corrected, students who are less comfortable with drinking and more sensitive to others’ disapproval drink less (Schroeder & Prentice, 1998; see also DeJong et al., 2006, 2009; Perkins, 2003). In this process, students are not conforming to a new norm but freed to act in violation of prevalent drinking norms.

**Increasing commitment through action: Saying-is-believing.** Other studies use saying-
is-believing procedures to drive home social information aimed at mitigating threats to belonging. Walton and Cohen (2011) bolstered their social-belonging intervention by asking students to videotape a speech explaining why worries about belonging are normal in the transition to college and improve with time using examples from their own lives. These videos, students were told, could be shown to future students to aid in their transition. Saying-is-believing procedures are also used in theory-of-personality interventions, which describe how people can change—and thus that bullies are not always bullies, and victims are not always victims—to reduce stress and aggression in response to peer bullying among adolescents (Yeager, Johnson, et al., 2014).

**Active reflection exercises.** Although active reflection exercises have not often been used to remedy threats to belonging, one study found that asking adolescents to reflect on times they experienced unconditional regard from peers reduced feelings of shame several weeks later when students received poor grades (Brummelman et al., 2014).

**Leveraging Belonging Motivations.** Other interventions leverage people’s motivations to form and maintain social relationships, to be appropriate members of their social community, and to contribute positively to others to promote positive behavior. Many interventions change representations of social norms—of what is normative of people “like me” (Hallsworth, List, Metcalfe, & Vlaev, 2014; Lewin, 1947; Paluck, 2009), of attractive or desirable people (Paluck & Shepherd, 2012), of a setting (Braga & Bond, 2008; Goldstein et al., 2008), or of what should be done (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Each approach can motivate conformity.

**Direct labeling.** Many interventions provide people direct information that defines what is typical or valued in their social community. In one trial of more than 100,000 delinquent
taxpayers, the most effective communication to encourage payment provided the strongest social norm statement (“Nine out of ten people in the UK pay their taxes on time. You are currently in the very small minority of people who have not paid us yet”) (Hallsworth et al., 2014). Among 16,515 citizens, it produced an additional £1.9 million (≈$2.73 million) in tax revenue over 23 days. Social-norm information embedded in utility bills can similarly reduce home energy consumption, in both small-scale trials (Schultz et al., 2007) and large-scale trials, especially among high users (Allcott, 2011).

A greater focus on belonging can increase the effectiveness of social-norm appeals. One study used normative information to increase the rate at which hotel guests reused towels (Goldstein et al., 2008). Although this study is best known for the specificity of the normative information—the greatest effects were observed when the norm referenced the very room the guest was staying in—an underappreciated aspect of the study is that all of the key conditions combined normative information (“Almost 75% of guests…[reuse] their towels more than once”) with an appeal to join a social community: “JOIN YOUR FELLOW GUESTS IN HELPING TO SAVE THE ENVIRONMENT” (capitalized in the original). Experimentally distinguishing these elements, one study found that normative information alone (“65% of people…have reduced their paper towel use”) caused no reduction in paper towel use in public restrooms. But when this information was supplemented with an invitation to “join in” and “do it together,” usage dropped by 14% (Howe, Carr, & Walton, in prep). Further studies suggest that normative information alone can make people feel pressured to change undermining effectiveness and may not generate a feeling of working together toward a common goal, an important source of motivation (Carr & Walton, 2014).

In the previous examples, people received information indicating that positive behaviors
were normative. What about when the norm is negative? In this case, making salient improvement can motivate positive change. For instance, the consumption of large quantities of meat is a negative and highly visible norm yet one that is declining. In one study, informing lunch goers that the number of people who make an effort to limit their meat consumption is rising (a “dynamic norm”) doubled the number who ordered lunch without meat (34%), as compared to both a static-norm condition (17%) and a neutral control condition (21%) (Sparkman & Walton, under review). The effects arose in part because people conformed to an anticipated future norm of reduced meat eating and because they saw change in others as effortful and thus as reflecting the importance to others, motivating personal change.

**Prompting new meanings.** Rather than providing normative information, other interventions change situations or tell stories that prompt new inferences about what is typical or valued. Braga and Bond (2008) randomized 34 crime hotspots to “broken-windows” policing—cleaning up graffiti and other signs of disorder to signal that rule-breaking was unacceptable. This reduced citizen 911 calls by 20% over 6 months relative to matched hotspots that received standard policing (see also Keizer, Linenberg, & Steg, 2008). Stories can also prompt new inferences. In one study, a radio soap opera featuring stories of positive intergroup relationships improved intergroup attitudes in post-genocidal Rwanda (Paluck, 2009).

Social information can also represent a behavior as an opportunity to help others, leveraging prosocial motivations. Grant and Hofmann (2011) manipulated whether a sign on hospital soap dispensers urged medical professionals to wash their hands to protect their own health or their patients’. The patient-focused sign raised the rate of proper hand washing from 81% to 89% over a 2-week period with no change for the self-focused signs. Change in a single word—but one that tied the behavior to a core social motivation—improved health practice.
Increasing commitment through action: Saying-is-believing. Other interventions connect foundational but tedious learning tasks to students’ desire to help others and make a difference (Yeager, Henderson, et al., 2014; see also Paunesku et al., 2015). In the pro-social purpose intervention, students identify a social problem important to them, review stories from other students about how a desire to make a difference motivated them to work harder and learn in school, and then write about their own their purpose for learning for future students. This can raise GPA in math and science, with the greatest effects for initially low-performing students, as well as promote sustained effort on boring foundational learning tasks.

Active reflection exercise: Contingent value-affirmation. In a novel approach, Fotuhi, Logel, Spencer, Fong, and Zanna (2014) asked smokers to reflect on a personally important value they shared with a close friend or family member who supported their intention to quit. This simultaneously allays a threat to self-integrity posed by the health risks of smoking and leverages belonging needs to motivate behavior change. At a 6-month follow-up, this increased the percentage of smokers who had quit (36%), as compared to both a control condition (1%) and a standard values-affirmation (16%).

Summary

Although many interventions squarely address one motivation for meaning-making or another, others overlap. For example, people almost always want to arrive at an accurate interpretation of their standing in the social world, yet that interpretation may be colored by self-integrity and/or belonging issues. In Walton and Cohen’s (2011) intervention, the root of African American students’ difficulties in the transition to college involved worries about belonging. Thus the intervention addressed the need to belong. Yet students were also surely motivated to form fact-based interpretations of their college experience, and thus drew reasonable inferences
from information about other students’ experiences. The intervention also took advantage of students’ motivation for self-integrity, by asking them to volunteer to make speeches for future students that described early worries about belonging as temporary. It may be that the most effective interventions take this eclectic approach, leveraging multiple motivations and change strategies. Before designing an intervention, however, researchers should be clear about which motivations are at play and which change strategies will be most effective at addressing those motivations to encourage adaptive changes in meaning.

V. Comparison to More Traditional Approaches to Social Intervention

Wise interventions conceptualize the person and the situation together, particularly the situation as viewed through the eyes of the actor. However, as noted earlier, many reforms separate the two and prioritize objective change in either situations or persons. To illustrate the distinctive contribution of wise interventions and how these approaches can complement one another, it is helpful to compare them.

The primary distinction between situation- and person-centric approaches is in the causal theory underlying the intervention. The former posits that the nature of objective situations is critical to success, and that optimizing situations can promote success (e.g., Hanks, Just, Smith, & Wansink, 2012). The latter emphasizes people’s traits, abilities, and habits of thought and interventions to alter them (e.g., Jaeggi et al., 2008). The idea is that people carry within them tools critical to success (e.g., intelligence), and that it is fruitful to improve the tools people have in their mental toolbox. Each approach is clearly important but each is enhanced by a consideration of subjective meaning-making. Because people are pervasive meaning-makers, every event—from a change in a situation to an effort to build personal skills—is subject to meaning-making, and this can alter the effectiveness of a reform. After reviewing situation- and
person-centric approaches separately, we discuss how these approaches can be combined.

**Changing Situations**

**Adding Resources.** Often we try to remedy problems by adding resources. As we have shown, however, the effectiveness of a new resource can be constrained by how people make sense of it, including new learning materials (Bandura & Schunk, 1981), constructive critical feedback (Yeager, Purdie-Vaughns, et al., 2014), as well as opportunities for intergroup contact (Aronson & Osherow, 1980; Brannon & Walton, 2013; Mallett & Wilson, 2010; see also Allport, 1954; Pettigrew & Tropp, 2006). Extra or overt help can lead people to infer that they lack ability and cannot succeed without assistance (Graham & Barker, 1990; see discussion of McCord, 1978 in Ross & Nisbett, 1991). Health risk information too can be ineffective if people find it threatening and reject it (Ehret & Sherman, 2014) or fail to apply it in situations that matter (Dal Cin et al., 2006). Pharmacological drugs can be less effective if their administration is invisible to patients, undermining placebo effects (Benedetti et al., 2003). In each case an understanding of meaning making can inform how best to present a new resource or opportunity.

Some major societal problems like poverty are defined by a lack of resources. Yet even in this case one pathway to poor outcomes involves beliefs, meanings, and inferences (Coleman et al., 1966; Destin & Oyserman, 2009). In one study of all 10th graders in Chile (N=168,552), students from lower income families were more likely to endorse a fixed mindset about intelligence, a perceived limitation that may predictably arise from a childhood without adequate resources (Claro, Paunesku, & Dweck, 2016). Moreover, mindsets about intelligence were as predictive of achievement test scores as family income, and were predictive at every income level. The results suggest that one mechanism by which poverty undermines school achievement is by inspiring toxic inferences. As Claro and colleagues write (p. 8667):
We are not suggesting that teaching students a growth mindset is a substitute for systemic efforts to alleviate poverty and economic inequality... Rather, we are suggesting that structural inequalities can give rise to psychological inequalities and that those psychological inequalities can reinforce the impact of structural inequalities... Research on psychological factors can help illuminate one set of processes through which economic disadvantage leads to academic underachievement and reveal ways to more effectively support students who face additional challenges because of their socioeconomic circumstances.

In another study, students in elementary schools with larger representations of racial-minority and low-income students showed lower rates of learning than students in other schools; yet this inequality was fully mediated by lower levels of trust reported by teachers in schools with more minority and low-income students (Goddard, Salloum, & Berebitsky, 2016). In these cases, addressing psychological processes directly may mitigate one pathway through which structural inequalities reproduce (e.g., Yeager, Walton, et al., 2016).

**Changing Incentives.** Incentives can change people’s behavior, such as motivating children to engage in otherwise boring tasks. But like resources, incentives are subject to meaning-making and this can lead to ironic consequences. For example, incentives can backfire if they cause students to see an otherwise enjoyable activity as drudgery undertaken just to earn a prize (Lepper, Greene, & Nisbett, 1971). This is especially problematic if at some point the incentive will become unavailable. Then people may be even less motivated to do the activity than they would have been had the incentive never been introduced.
Disincentives too can inspire undesirable inferences. In a classic example, a fine imposed on parents who picked up their children late at a day care increased late pick-ups—presumably because it came to be regarded as a fee for services and the motivation to fulfill one’s obligation to the school ceased to govern behavior (Gneezy & Rustichini, 2000; see discussion in Miller & Prentice, 2012). Additionally, “zero-tolerance” policies and other punitive responses to misbehavior in school can foster feelings of disrespect in students and ironically incite misbehavior. One intervention that encouraged teachers to adapt an empathic rather than a punitive mindset about misbehavior cut suspension rates among adolescents in half over a school year (Okonofua et al., 2016).

A key to understanding incentives, then, is how people interpret them. Consider a study that randomized poor, rural families in Morocco to receive (a) cash transfers conditional on children’s school attendance, (b) cash transfers labeled as educational supports but not contingent on school attendance, or (c) no transfers (Benhassine, Devoto, Duflo, Dupas, & Pouliquen, 2015). Both cash transfer conditions increased school attendance and learning but the benefits were largest when the transfers were merely labeled educational supports. Making the cash conditional on school attendance—making it an incentive—caused no added benefit. Instead, the government endorsement of education, conveyed through cash transfers, led parents to see education as important for their children’s future and increased confidence in the quality of local schools. Thus with incentives as with resources it is essential to take into account meaning.

Finally, incentive schemes fundamentally proceed from the assumption that people are inadequately motivated to engage in the behavior being incentivized. This is sometimes the case. But often people have a basic motivation to behave in positive ways. This may be one reason
why teacher incentives, for instance, can be ineffective in improving student learning (Fryer, 2011). Teachers may not need more motivation but better strategies for how to help children succeed, such as how to instill productive mindsets in children and build trust that promotes learning (e.g., Gehlbach et al., 2016; Lepper et al., 1993; Okonofua et al., 2016; Yeager, Purdie-Vaughns et al. 2014).

**Behavioral Nudges.** An important innovation in recent years is the advent of “nudges.” Although the term is used in various ways, we define nudges as changes to the structure of situations to make specific positive behaviors or decisions more likely or negative ones less likely (Sunstein, 2016; Thaler & Sunstein, 2008). A classic example is what happens if one does nothing and accepts the status quo, such as having to sign up to become a potential organ donor versus having to indicate an unwillingness to do so. Changing the default can have large impacts on human behavior, including increasing membership on organ donation lists (Johnson & Goldstein, 2003) and participation in retirement saving plans (Beshears, Choi, Laibson, & Madrian, 2008). Nudges have proven to be an innovative way of changing behavior on a large scale. Both the British and United States governments have established “nudge units” in which psychologists and behavioral economists find more effective ways of delivering policies and social services by making small changes to social situations (e.g., Service et al., 2014).

Nudges are similar to wise interventions in some ways, including the idea that seemingly small changes to situations can bring about large changes in behavior. There are, however, important differences. First, nudges vary in the extent to which they draw on psychological theory, sometimes deliberately so (Sunstein, 2016). Often nudges are more problem-driven, seeing what sorts of changes will be effective in a particular situation. We believe that the more people’s responses to situations are understood in terms of psychological theory, especially
meaning-making processes, the better understood and the more effective these changes will be (e.g., Hallsworth et al., 2014; Redelmeier et al., 2003).

For example, why does setting the default for people to be organ donors increase donation rates? It is easy to think that this simply make becoming a donor more convenient (Johnson & Goldstein, 2003). But studies show that defaults convey implicit norms. When the default is not to donate, people think of organ donation as equivalent to giving away half their wealth to charity when they die. But when the default is to donate, people think it is more like letting other people go ahead in line (Davidai, Gilovich, & Ross, 2012), an easier bar to clear. A key is the meaning people attach to defaults and not simply how convenient an action is.

A deeper understanding of people’s interpretations and motives allows for predictions about what type of changes will change behavior. To encourage people to get a vaccine, is it better to scare people with images of a gruesome disease or to ask them to check their schedules? Does it matter whether people sign at the top or at the bottom of a car insurance form? Will it be more effective to ask health care workers to wash their hands to protect their own health or their patients’ health? Should a hotel emphasize environmental benefits to encourage guests to reuse towels or local norms?

Psychological theory allows one to form testable hypotheses to answer these questions. Thus, to encourage a preventative shot, a map and schedule is better than fear (Leventhal et al., 1965; Milkman et al., 2011), an implication of research on goal pursuit (Gollwitzer, 1999). To encourage truth-telling, the signature line should be at the top (Shu et al., 2012), an implication of consistency motivations outlined in dissonance theory (Festinger & Carlsmith, 1959). To encourage soap use, an emphasis on helping patients is more effective (Grant & Hofmann, 2011) and to promote towel reuse social norms are more effective (Goldstein et al., 2008), implications
of the need to belong (Baumeister & Leary, 1995).

Psychological theory also informs how to make change lasting—how to truly change lives. Changing a situation can elicit different behavior within that situation—making healthier options more convenient can increase healthy eating in a cafeteria (Hanks et al., 2012). However, when people exit this situation, what can change their future behavior? Certain change within a situation can help people clear important thresholds. Simplifying the financial aid application process can unlock resources that help students pursue college (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; see also Hoxby & Turner, 2014). However, many of the most important problems people face—from improving marriages, to raising achievement, to living in healthier ways—require sustained change in many behaviors over time and situations. To alter this requires a theory of self—including, especially, of how people make sense of themselves, situations, and classes of situations. By changing meanings—meanings that can become self-reinforcing—wise interventions can change persons as well as situations, and thus improve the course of people’s lives (e.g., Finkel et al., 2013; Cohen et al., 2009; Walton & Cohen, 2011).

Lastly, psychological theory can give rise to interventions that are counterintuitive and never would have occurred to someone relying on common sense, such as the idea that prolonging a painful medical procedure can improve patients’ well-being (Redelmeier et al., 2003). In short, a common sense approach can lead to effective ways to change behavior in one situation, but psychological theory that describes how people make sense of themselves and situations can provide deeper insights and more powerful and long-lasting improvements.

**Changing People**

A second approach focuses on the traits, skill, and habits of thought of the individual. Some people are smarter than others, better able to assimilate new information and put it to use.
Some are more self-controlled or grittier or have more adaptive habits of thought. These qualities predict major life outcomes. For instance, self-control measured in childhood predicts greater earnings, better health, and less criminality in adulthood above and beyond childhood IQ and socioeconomic status (Moffitt, et al., 2011; see also Duckworth & Seligman, 2005; Duckworth, Peterson, Matthews, & Kelly, 2007; Mischel et al., 1989). Such personal skills and habits are relatively enduring qualities of the person thought to facilitate effective behavior across situations. In contrast, wise interventions address “meta” inferences, people’s beliefs and inferences about themselves and social situations (Dweck, 2008). To predict how a student will do on a test, a person approach would focus on her basic level of intelligence, self-control, or grit. Wise interventions focus on the student’s beliefs about her abilities and the situation—like how capable she thinks she is.

Person-centric interventions thus aim to enhance capacities or remedy deficiencies in skills or habits of thoughts. An advantage is that, in theory, the person acquires new capacities they can use to their benefit across a wide range of situations.

**Personal Skills.** The most ambitious person-centric interventions seek to enhance general intellectual and psychological skills that serve the individual over the life course. Education itself is of course such an intervention. Schooling promotes the development of intelligence (Brinch & Galloway, 2011; Duyme, Dumaret, & Tomkiewicz, 1999; see Nisbett et al., 2012). And high-quality preschool programs can improve children’s readiness for school (e.g., Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Woodhead, 1988). Social competencies can also be built through long-term interventions (Gertler et al., 2014). For example, Fast Track, a multidimensional 10-year program to promote social competencies in young children with conduct problems, reduced antisocial behavior in adolescence (Dodge et al., 2013) and, at age
25, reduced the percentage of participants with a psychiatric problem from 69% to 59%, increased reported happiness, and reduced convictions for substance abuse and violent crimes (Conduct Problems Prevention Research Group, 2015).

Other person-centric interventions aim to build specific skills theorized to be of general importance. For instance, some research finds that training adults in tasks that tax and thus expand working-memory capacity can raise fluid intelligence scores (Jaeggi et al., 2008; see also Schmiedek et al., 2010). A preschool curriculum using structured dramatic play among other techniques enhanced executive function in children (Diamond et al., 2007; for research with adults, see Baumeister et al., 2006; Finkel et al., 2009; Inzlicht & Berkman, 2015; Job, Friese, & Bernecker, 2015). Encouraging mothers to talk more with their infants and toddlers increased children’s vocabulary and language production a year later, an important element of school readiness (Weber, Fernald, & Diop, in press). An intervention that taught mothers how to be more responsive to their irritable 6 to 9-month-old babies raised the percentage of babies who were securely attached at 12 months, an important predictor of social and behavioral functioning (van den Boom, 1994).

These studies suggest the value of theory-based interventions to enhance capacities; yet caution is in order. Although correlational evidence linking various capacities to life outcomes is strong, evidence that precise interventions to enhance these capacities cause improvement in life outcomes is notably lacking. Proxy measures like intelligence test scores (Jaeggi et al., 2008), executive-function test scores (Diamond et al., 2007), and language production (Weber et al., 2016) may, in some cases, be increased by well-designed interventions. But these measures are not outcomes of importance unto themselves (Sternberg, 2008). For example, there is controversy about whether specific cognitive-training programs (e.g., working-memory training)
enhance broad capacities or produce narrow improvement in the ability to perform well on a specific test or task (see Inzlicht & Berkman, 2015; Melby-Lervåg Hulme, 2013; Miles et al., 2016; Shipstead, Redick, & Engle, 2012; Simons et al., 2016). In general, there is surprisingly little evidence that precisely targeted capacity-training interventions improve functioning outside testing environments, such as better school achievement, work performance, competence in everyday cognitive tasks, health, relationships, or well-being, although more comprehensive reforms can (Conduct Problems Prevention Research Group, 2015; Gertler et al., 2014).

Moreover, in some cases where precise capacity-training interventions have improved life outcomes, these gains have been mediated by a change in meaning-making. One self-control training intervention—effortfully squeezing a handgrip twice a day for 2 weeks—increased students’ end-of-year GPA seven months later, but there was no evidence of improvement in core self-control skills (Job, Friese, & Bernecker, 2015). Instead, the gains were mediated by a reduction in students’ reports of the extent to which they avoided putting forth effort in their studies.

**Habits of Thought.** Other interventions aim to remedy negative habits of thought or to instill good habits through the principles of conditioning (Watson, 1913). These learned associations can then shape inferences and behavior in meaningful ways (see Gawronski & Bodenhausen, 2006).

In exposure therapy, people are exposed to successively closer images or experiences relevant to a source of anxiety in a safe context (e.g., thinking about an airplane, viewing an airplane, boarding an airplane). Doing so mitigates the threatening association and improves clinical outcomes (McNally, 2007). Facilitating a helpful negative association, the introduction of graphic cigarette warning labels appears to increase smokers’ motivation to quit, presumably
by repeatedly pairing smoking with threat and illness (Hammond, 2011; Hammond et al., 2003). Understanding learning principles can also prevent the formation of deleterious associations. In one study, pediatric cancer patients given novel candies before undergoing chemotherapy were less likely to later develop food aversions, presumably because they associated nausea with the novel candy not normal food (Broberg & Bernstein, 1987).

Other interventions modify approach/avoidance associations. In an impressive finding, alcoholic inpatients taught to provide an avoidance response to alcohol by repeatedly pushing a joystick away from images of alcohol began to automatically associate alcohol with avoidance and, a year later, were less likely to have relapsed (46% vs. 59%) (Eberl et al., 2013; Wiers, Ebert, Rinck, Becker, & Lindenmeyer, 2011). There is also evidence that repeatedly pulling a joystick toward the self in response to images of racial minorities can facilitate automatic associations between the self and minorities and reduce measures of implicit prejudice (Phills, Kawakami, Tabi, Nadolny, & Inzlicht, 2011; see also Forbes & Schmader, 2010; Kawakami, Steele, Cifa, Phills, & Dovidio, 2008; see also Levy, Pilver, Chung, & Slade, 2014).

A challenge for exercises to change associations is that they may be diluted and fail in the long-term if reality provides a robust contrary association—which may be why a maladaptive association exists in the first place (see Lai et al., 2016). However, changing how people make sense of real-world experiences may set up new patterns of behavior (e.g., Cohen et al., 2009; Marigold et al., 2007; Walton & Cohen, 2011). Consistent with this view, one intervention designed to remedy implicit bias among math, science, and engineering faculty had no such effect. Nonetheless, three months later the intervention raised awareness of gender bias and the motivation to be non-biased, improved the department climate (e.g., reports of how much faculty felt they fit in and valued), and, when more than a quarter of department faculty took part,
increased reported action to promote gender equity (Carnes et al., 2015). Another study found no lasting reduction in implicit racial prejudice but increased concern about prejudice over two weeks and, in a subsample recruited two years later, greater likelihood of objecting in an online forum to an essay endorsing racial stereotyping (79% vs. 48%) (Forscher, Mitamura, Dix, Cox, & Devine, under review).

**Discussion.** To build skills and/or change associations, person-centric interventions typically involve practice and/or repetition. As Diamond and Lee (2011) write of interventions to promote self-control skills, “All successful programs involve repeated practice and progressively increase the challenge to executive functions” (p. 959). In some cases, this practice occurs in a module outside people’s normal lives (e.g., an online task; Jaeggi et al., 2008), and as such may require significant motivation. In other cases, it may be embedded in normal life (e.g., a preschool curriculum, Diamond et al., 2007). A consequence of this “practice-makes-perfect” model is that person-centric interventions typically have a dose-response relationship with outcomes (e.g., Jaeggi et al., 2008). In contrast, as we have seen, interventions to change meanings can involve a single dose that, by altering a recursive process, causes lasting change (e.g., Walton & Cohen, 2011). Thus timing, not dosage, may be more important for wise interventions (Cook et al., 2012; Raudenbush, 1984). Because effective person-centric interventions are relatively intensive, they may also be more costly. One training program aimed at staving off some of the cognitive declines associated with aging compensated participants for completing exercises with as much as €1,950 (≈$2,200; Schmiedek et al., 2010). Such costs may be justified by a program’s effectiveness. However, they also suggest the value of finding ways to embed effective training activities in daily life (Diamond & Lee, 2011). A promising approach involves what Robinson (2011) calls “stealth interventions”—fun daily activities that cause
benefits even without recipients’ awareness, such as ethnic dance groups, which promote exercise and weight loss among adolescents.

There is also a risk in focusing heavily on the qualities of people. Psychologists have long identified a general error termed the dispositionist bias or the fundamental attribution error, in which people place excessive weight on internal, personal factors to explain behavior as compared to external, situational factors (Ross & Nisbett, 1991). A focus on internal limitations may obscure people’s existing capacities and strengths (Seligman et al., 2005) and detract attention from other factors that constrain outcomes. It is thus helpful to consider whether negative outcomes might reflect situational factors or beliefs and inferences as well as or instead of personal limitations (e.g., Rogge, Cobb, Lawrence, Johnson, & Bradbury, 2013).

Consider self-control, which is commonly understood as an ability (Mischel et al., 1989). Yet self-control is not just a skill. It also involves beliefs and meanings. For instance, a reluctance to wait in the classic delay-of-gratification paradigm may reflect a child’s belief that the experimenter’s return with the promised larger reward is less than certain (Kidd, Palmeri, & Aslin, 2013): “a bird in the hand is worth two in the bush.” If people think that everyday life settings cannot be counted on to reward greater effort they may choose not to self-regulate even when they could do so (Coleman et al., 1966). Willingness to delay gratification can also be increased simply by changing meanings. In one line of research, children exposed to a storybook character who learns that waiting can be energizing not depleting adopted more effective waiting strategies and waited longer (Haimovitz, Dweck, & Walton, under review). Knowing that waiting longer was possible, children figured out how to do so (see also Karniol et al., 2011). Another study found that teaching college students that people can choose what to believe about willpower, encouraging a view of willpower as energizing not depleting, improved academic
regulation a month later and semester grades among students who faced high self-control demands (Job, Flueckiger, Bernecker, Lieb, & Mata, 2016; see also Job, Dweck, & Walton, 2010; Job, Walton, Bernecker, & Dweck, 2015). In short, promoting a view of environments as reliable and of self-regulation as energizing not depleting may promote self-control. Thus it is important to identify when limitations in personal skills constrain outcomes and when belief systems do, and to use person-centric and wise interventions accordingly.

VI. Combining Approaches

Society will never solve social problems without creating situations that help people succeed (situation-centric reforms); without building important skills and habits in people (person-centric reforms); and without addressing the critical role of subjective meaning and the barriers to effective behavior it creates (wise interventions). How can these approaches be brought together and, where appropriate, combined?

We have emphasized, for example, that the opportunities afforded by the context in which wise interventions take place are essential, such as opportunities to learn created by school systems and educators (see Table 1; Yeager & Walton, 2011). Efforts to expand opportunities and to help people take advantage of these are thus complementary (e.g., Bandura & Schunk, 1981). It is thus imperative to systematically examine how wise interventions intersect with diverse contexts; doing so can begin to map what barriers to better outcomes exist where. For instance, a growth-mindset of intelligence intervention may be less effective in schools that are chaotic or under-resourced and thus do not provide students high-quality learning opportunities; such a finding would diagnosis structural impediments and imply structural reforms. Such efforts are already underway. The National Growth Mindset Study and the College Transition Collaborative are each testing mindset interventions with large samples of students entering
diverse high schools and colleges. At a high level, exploring the intersection of psychology and social contexts will help show what capacities for improvement are available but undermined by psychological processes and where psychological processes are not the relevant constraint, for instance if capacity itself is inadequate.

Specific reforms can also be complementary. In the transition to college, a situation-centric approach might be to simplify forms, transmit systematic reminders of deadlines to students, increase financial aid, or provide low-income students information about graduation rates, net costs, and selective colleges they might be a good fit for (see respectively: Bettinger et al., 2012; Castleman, Owen, & Page, 2015; Goldrick-Rabb et al., 2012; Hoxby & Turner, 2014). These strategies address important barriers just not social-psychological challenges like feelings of inadequacy and nonbelonging. Addressing these, as we have seen, can transform effects on college students’ success (Aronson et al., 2002; Harackiewicz et al., 2014, 2016; Miyake et al., 2010; Stephens et al., 2012; Walton & Cohen, 2011; Wilson & Linville, 1982, 1985; Yeager, Walton, et al., 2016). Because these approaches address different barriers to a successful college transition, combining them may be fruitful.

In some cases, a single reform can serve multiple functions. Setting defaults thoughtfully no doubt makes a personally and socially positive choice easier (Johnson & Goldstein, 2003) even as it also signals what is normative (Davidai et al., 2012). Providing cash to poor families expands opportunities even as it conveys the importance of education (Benhassine et al., 2015). Multi-component interventions can also accomplish multiple aims. Earlier we described the van den Boom (1994) intervention, which taught mothers to be responsive to irritable babies, promoting secure attachment. This intervention aimed to build mothers’ skills in interpreting babies’ signals accurately, a person-centric approach in the service of meaning-making.
Similarly, Fast Track, the 10-year program to promote social competencies (Conduct Problems Prevention Research Group, 2015), included multiple components including social-skills training, parent groups, curricula, etc., but had as a primary goal discouraging children from drawing global interpretations for hostile events (see Hudley & Graham, 1993). Indeed, the intervention’s effect in reducing adolescent antisocial behavior was mediated in part by a reduction in children’s tendency to see peers who ambiguously inflict harm as intentionally hostile (Dodge et al., 2013; see also Heller et al., 2015). Likewise, interventions that teach specific meditation or mindfulness practices help people cultivate emotion-regulation skills, but what these skills do is help a person reflect on experiences, feelings, and thoughts in more productive ways—a change in meaning, which can improve health, well-being, and personal relationships (Creswell et al., 2016; Fredrickson et al., 2008).

It is also important to consider how wise interventions interact. Although it is tempting to assume that combining two effective interventions will increase their impact, this is not always the case (e.g., Good et al., 2003; Paunesku et al., 2015; Yeager, Walton et al., 2016 Experiment 2). Since the combined messages will be understood together, the meanings they inspire must function well together (e.g., Fotuhi et al., 2014). In some goal-setting interventions, for instance, people both identify goals and how they will implement them (Duckworth et al., 2013; Morisano et al., 2010; see also Eskreis-Winkler et al., 2016). In other cases, even distinct interventions may overlap, and may be best understood as different avenues into a single psychological system. For instance, value-affirmation and social-belonging interventions both aim to remedy identity threat, although they do so in different ways (Garcia & Cohen, 2012). It is unclear whether combining them would increase their impact. Interventions may also compete with one another (Jessop, Sparks, Buckland, Harris, & Churchill, 2014; see also Harris et al., 2014). One study found that
both a social-belonging intervention and a novel affirmation-training intervention, which encouraged students to see their daily activities as expressions of their values and ways to stay balanced, raised women’s grades in male-dominated engineering fields (Walton, Logel, et al., 2015). However, whereas the former increased women’s friendships with men in engineering the latter increased women’s gender identification and friendships with women. It is interesting to speculate what would have happened had women received both messages. Although it is possible to develop more friendships with both male peers and women, receiving both messages at once could also be counterproductive.

VII. Implications and High Priority Directions for Future Research

Our review highlights several important high-level directions for future research.

Mechanisms of Long-Term Change

Wise interventions cause their most powerful and wide-ranging benefits when they change people’s ongoing behavior in diverse circumstances over time. It is essential to better understand how this broad and lasting change occurs. In general terms, we have argued that interventions that change meanings can alter recursive cycles of psychology, behavior, and situations. An fundamental question involves the relative roles of the person and situation aspects of this cycle. Suppose a growth-mindset of intelligence intervention changes a student’s belief about the malleability of intelligence and, in turn, promotes learning-oriented behaviors in school (e.g., greater effort, seeking out effective learning strategies). Perhaps initial improved outcomes confirm the student’s belief in the malleability of intelligence and this belief system drives long-term gains. Consistent with this process, research shows that, because people recruit reasons to support new beliefs, new beliefs readily persevere (e.g., even when their original basis has been discredited; Ross, Lepper, & Hubbard, 1975). Alternately, perhaps the initial change in the
student’s behavior is recognized by the teacher (Blackwell et al., 2007), who then treats the student in more positive, growth-oriented ways (Rosenthal & Jacobson, 1968). Perhaps this mentorship facilitates lasting gains (Brady et al. in prep B), or perhaps the teacher places the student in a high-performance track or removes them from a remedial program, exposing them to higher achieving peers (see Cohen et al., 2009). In an extreme case, perhaps these changes in situation drive lasting improvement even with no lasting psychological change in the student (e.g., in beliefs about the malleability of intelligence).

To what extent do lasting benefits arise from enduring change in how people make sense of situations (if/then beliefs like, “If I do poorly, it means I need to work harder”; Dweck, 2008; Mischel & Shoda, 1995) versus from change in the situations people enter as a consequence of an initial change in meaning-making? Typically, these processes will work in tandem and contribute to the robustness and longevity of intervention effects. But distinguishing them will inform basic theory and predictions about when lasting change will be more or less likely.

Adaptation, Scaling, and Social Change

As we have seen, wise interventions deliberately start small, testing theory-driven hypotheses in specific populations in specific contexts. An essential question involves how to scale up these interventions to new populations and contexts (Yeager & Walton, 2011). Meeting this challenge requires: (1) deep expertise in the psychological process targeted by the intervention and tools to alter it; (2) deep expertise in the setting and population at hand, and the nature of the psychological process in this context; and (3) effective and reliable means of large-scale intervention delivery.

1. Psychological Expertise. Psychological ideas and interventions often involve nuances that, absent a deep appreciation of psychological theory, may seem trivial yet are essential. For
example, growth-mindset interventions convey that intelligence can grow with hard work, effective strategies, and help from others. Partial and inaccurate understandings of growth mindset—what Dweck (2016) calls “false growth mindset”—can inspire practices that do not substantively engage students in learning, such as praising students for effort alone, even ineffective effort, or telling students they “can do anything” without providing learning strategies that help students get there (see also Yeager, Romero, et al., 2016).

Marigold and colleagues’ (2007) intervention to improve relationships for people with low self-esteem assumed that a compliment from their romantic partner had a general meaning (“Explain why your partner admired you. Describe what it meant to you and its significance for your relationship.”). When people were asked instead if the compliment had a general meaning (“Explain whether you think what your partner said indicated that he/she admired you…”) there were no benefits. Basic research shows why this detail matters: People with low self-esteem are not unaware that a partner could truly love them. They crave this possibility but fear rejection and so tend to doubt it (Murray et al., 2006). Thus it is not helpful to ask people to consider a broader meaning—they already have. It is essential to assume this meaning and to encourage people to elaborate upon it. Yet it is easy to imagine how a shallow understanding of this psychological process could lead a well-intended person to mistake one for the other.

One of the largest effects on voter turnout ever observed was obtained by asking citizens the day before two major statewide elections a series of questions about “being a voter” (e.g., “How important is it to you to be a voter in tomorrow’s election?” versus “How important is it to you to vote…”; Bryan et al., 2011). This language represents voting as an opportunity to become a kind of person. Its effectiveness, however, hinges on whether being “a voter” in the upcoming election is a valued identity people aspire to. Absent this understanding, one might imagine that
the intervention should work in any election, including in low-turnout, low-profile, uncompetitive ones (Gerber, Huber, Biggers, & Hendry, 2016). Yet in this context being “a voter” does not carry significant identity stakes (Bryan, Walton, & Dweck, 2016).

Wise interventions are not simple. They are predicated on a deep understanding of psychological processes built from basic research and an appreciation of the context. It is thus essential for researchers to communicate clearly about psychological processes and to make their assumptions explicit.

2. Expertise in the Setting and Population. It is also necessary to understand the social context and how the targeted psychological process arises, matters, and may be modified there (Yeager & Walton, 2011). If a psychological exercise does not speak to people’s experience in a setting, it does nothing at all. Thus it may be necessary to revise an intervention to work effectively in a new context (see Yeager, Walton et al., 2016 Experiment 1).

For instance, to customize a previously effective growth-mindset of intelligence intervention for students in the transition to high school (Paunesku et al., 2015), Yeager, Romero, and colleagues (2016) used focus groups, interviews, and rapid, iterative A/B experiments to address such design questions as: (1) Is it better to simplify text using bullet points than paragraphs? Yes. (2) Is it more effective to tell recipients that the exercise is designed to help them or that it is a way to help future 9th graders? The latter. (3) Is it helpful to include quotes from admired adults and celebrities? Yes. In one large trial, the revised intervention outperformed the original intervention in increasing challenge seeking and shifting attributions for difficulty from the person (e.g., low ability) to processes (e.g., ineffective strategies)—mechanisms of greater learning that follow from a growth-mindset. In another, the revised intervention significantly raised grades among poorly performing students relative to a control
condition, replicating prior research.

3. **Standardized Means of Intervention Delivery.** No matter how well-designed an intervention is, it will be ineffective if it does not impart the key psychological message effectively. Errors can arise when a complex idea is translated through intermediaries (e.g., from researchers to administrators to teachers to students), the “operator” problem. Thus standardized means to reach recipients directly are valuable. One such means is carefully designed online reading-and-writing modules. Such modules can be accessed by people anywhere with an Internet connection; can impart complex psychological ideas using standardized materials; and can incorporate interactive features that enhance engagement and personalization, such as saying-is-believing exercises. They have been used effectively to reach thousands of students with growth-mindset, social-belonging, and related interventions (Paunesku et al., 2015; Yeager, Romero et al., 2016; Yeager, Walton, et al., 2016). Moreover, once evaluated in a setting, online interventions can be provided on an ongoing basis to more people at low cost.

Second, wise interventions can be embedded in direct ongoing communications. A company, Opower, partners with utilities to embed social-norm information in bills received by millions of residential customers. In one evaluation of nearly 600,000 households, this reduced home energy use by 2%, with the greatest reductions among high-users (Allcott, 2011), an effect estimated to be equivalent to what would arise from a short-term price increase of 11-20%. Nickerson and Rogers (2010) embedded an implementation-intention intervention in phone scripts used to encourage more than 280,000 citizens to vote, raising turnout by 4 percentage points. Brady and colleagues (in prep B) revised a form letter a university sent to students to place them on academic probation to reduce stigma (e.g., emphasizing valid reasons students experience difficulties in college and stories of growth from prior probationary students); this cut
the percentage of students who were suspended or had dropped out a year later from 52% to 21%. Harackiewicz and colleagues (2012) mailed brochures to parents and created a website highlighting how to talk with adolescents about the usefulness of math and science courses; this increased students’ math and science enrollment. Finkel and colleagues (2013) piggybacked on an ongoing longitudinal survey of married couples to embed a randomized intervention on how to handle conflicts; this improved marital quality over a year. Standardized messages can also be incorporated in social media. One social-norm message seen by 61 million people on Facebook raised turnout in US Congressional elections by an estimated 340,000 (Bond et al. 2012; for other examples, see Goldstein et al., 2008; Grant & Hofmann, 2011; Hallsworth et al., 2014; Hammond et al., 2003, 2004; Milkman et al., 2011; Shu et al., 2012).

Another approach is to intervene with one person so as to alter how this person perceives or behaves toward other people. This can improve the quality of important relationships (romantic relationships; Marigold et al., 2007, 2010; parent-child relationships, van den Boom, 1994; teacher-student relationships, Gehlbach et al., 2016) and outcomes that arise from these relationships (Bugental et al., 2002; Harackiewicz et al., 2012; Weber et al., 2016), such as increased learning in school (Gehlbach et al., 2016; Rosenthal & Jacobson, 1968). Moreover, when one person interacts with many other people, altering this person’s mindset and behavior can have broad consequences. Okonofua and colleagues (2016) randomized 31 middle-school teachers to an intervention aimed at encouraging an empathic rather than punitive mindsets about student misbehavior; this cut suspension rates among the 1,682 students they taught by half. Paluck and colleagues (2016) randomized 56 middle schools to an intervention in which 15% of students at each treated school were randomized to receive an anti-conflict norm intervention or not. A total of 728 students received the intervention. This reduced disciplinary problems among
the 11,938 students in the treated schools over a year by 30%. The greatest effects were observed in schools in which more of the participating students were influential within the school peer network and thus positioned to alter school norms (see also Powers et al., 2016). In these ways, wise interventions can leverage social structures and relationships to instigate large-scale change.

**VIII. Conclusion**

Social-psychological processes play a central role in many social and personal problems. It is possible to understand these processes in basic research; to transform this understanding into interventions that effectively alter them and improve outcomes in field settings; to join this with expertise in settings and populations to adapt interventions for new contexts; and to deliver psychological interventions to remedy problems on a socially meaningful scale.

Psychological processes are not “small” in comparison to “big” problems like poor achievement or inequality, as people sometimes think. Although structural reforms are often also essential, from the perspective of a person deciding how to act there is nothing more important than how that person makes sense of him- or herself and the social situation. As Yeager and Walton (2011, pp. 283-284) wrote:

> From the perspective of a researcher or teacher, an implicit theories workshop or a value-affirmation writing exercise is just one of many classroom experiences given to students. But to a student sitting at a desk in the third row worrying about whether a poor test score means she is stupid or whether others will reduce her to a negative stereotype, an experience like learning that the brain can grow and form new connections when challenged or being invited to describe personally important values may feel quite “large.”

Further, psychology can be understood systemically. People can think that psychological
processes matter but are idiosyncratic, as though everyone’s internal psychological life is unique, and thus not relevant on a collective level that could contribute to social problems. If this were the case, one-on-one therapy might be effective but not social-psychological interventions. Yet there are many predictable psychological patterns common across people and contexts. The better we understand these patterns—the more sophisticated our theories of psychology—the better equipped we will be to change those that are maladaptive.

Finally, psychological processes can be changed. Even when people think that these processes matter and can be systematic, they may throw up their hands at the possibility of changing them, especially for large numbers of people and over meaningful periods of time. Certainly psychological change can be challenging. Yet understanding times and contexts in which change is more possible than others (e.g., during transitions), using effective strategies to instigate change (e.g., saying-is-believing), and doing so in settings in which recursive processes can transmit an initial change in psychology forward in time can cause lasting improvement in the lives of many people. The social-psychological approach, conceptualizing the person and the situation together, as viewed through the eyes of the actor, is thus an efficient, often counterintuitive, and yet powerful way to help people succeed in their lives.
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Supplementary Tables

Supplementary Tables 1-3 provide a theoretical organization and brief summaries of more than 150 interventions culled from our literature review. Supplementary Table 1 includes interventions that address the need to be accurate. Supplementary Table 2 includes interventions that address the need for self-integrity. Supplementary Table 3 includes interventions that address the need to belong. Interventions that cut across categories are referenced in multiple tables but with a primary description in one. Although most entries reference a specific study, in some cases interventions that have been examined in multiple studies—for instance, in multiple forms or with multiple populations—are described in a single entry with multiple citations.
Table S1. Wise interventions approach #1: Wise interventions that address the need to be accurate.

<table>
<thead>
<tr>
<th>Sub-Category</th>
<th>Object of Judgment</th>
<th>Reference</th>
<th>Specificity of Intervention</th>
<th>Content Area</th>
<th>Change Strategy</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>My identity</td>
<td>Who am I? (Current identity)</td>
<td>Eskreis-Winkler et al., under review</td>
<td>Specific</td>
<td>Self-regulation</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Asking adolescents to role play “someone slightly hard-working than you” increased persistence following failure and focus on challenging learning tasks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miller et al., 1975</td>
<td>Specific</td>
<td>Education</td>
<td>Direct labeling, of self-identity</td>
<td>5th graders commended by teachers and other school personnel for keeping their room clean and being litter-conscious, as compared to encouraging them to clean up and those in a control condition, littered less when unobtrusively observed as long as seven weeks later.</td>
</tr>
<tr>
<td>Who could I become?</td>
<td>Who could I become? (Prospective or potential identity)</td>
<td>Bryan et al., 2011; see also Bryan et al., 2016; Gerber et al., 2016</td>
<td>Specific</td>
<td>Civic behavior</td>
<td>Prompting new meanings, by asking leading questions</td>
<td>Changing the grammatical structure of 10 survey items completed the day before a major election to represent voting in terms of nouns—as an opportunity to become “a voter”—rather than in verbs—as a task to be completed, “to vote”—increased voter turnout by 11 percentage-points.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oyserman et al., 2006; see also Oyserman et al., 2002</td>
<td>General</td>
<td>Education</td>
<td>Active reflection exercise, on future selves; Prompting new meanings, by providing new information</td>
<td>Predominantly African American inner city students in a high poverty middle school took part in an 11-session program delivered approximately twice weekly over 7 weeks to encourage children to imagine themselves as becoming more successful in school and becoming successful adults, to identify potential obstacles, to understand these as normal and not self-defining, and to identify strategies to overcome obstacles. As compared to a randomized control group this improved students’ standardized test scores and grades, and reduced depression, absences, and in-school misbehavior through a 2-year follow-up.</td>
</tr>
<tr>
<td>Who do I not want to become or be confused with?</td>
<td>Berger &amp; Rand, 2008</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting by providing new information</td>
<td>Posting a flier in undergraduate dorms indicating that most drinking on campus is done by graduate students reduced drinking among undergraduates who did not want to be confused with graduate students.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sherman et al., 1992</td>
<td>Specific</td>
<td>Close relationships</td>
<td>Prompting new meanings, by</td>
<td>Arresting rather than warning married and employed men detained for misdemeanor domestic battery reduced the incidence of subsequent domestic violence offenses;</td>
</tr>
<tr>
<td>My self</td>
<td>Do I think positively about my self?</td>
<td>Lyubomirsky, et al., 2011; see also Boehm et al., 2011; Emmons &amp; McCullough, 2003; Layous et al., 2013; Lyubomirksy et al., 2005; Sheldon &amp; Lyubomirsky, 2006; Seligman et al., 2005</td>
<td>General</td>
<td>Well-Being</td>
<td>Active reflection exercise, on a positive aspect of self; Prompting by providing new information</td>
<td>College students were encouraged to take 15-minutes per week over 8 weeks (1) to make regular expressions of gratitude—to write about “times in their lives when they were grateful for something that another person did for them and then writing a letter about those experiences directly to that person (but not sending it)”—or (2) to make regular expressions of optimism—to write about “to visualize living a life consistent with their ideal self” in terms of romance, educational attainment, family life, etc. Students who self-selected into a study on a “happiness intervention” (who were presumably motivated to increase their happiness) and who completed one of these exercises, as compared to those in a randomized control condition (who listed what they had done over the past week to increase “organizational skills”) and to students who self-selected into a study on “cognitive exercises” in any of the conditions, reported greater well-being at the end of the writing period and at a 6-month follow-up. Other trials have found that the effectiveness of such activities can be enhanced when people read a peer testimonial, who said the activity helped them (Layous et al., 2013). Gratitude exercises can also improve well-being and sleep quality among adults with chronic disease (Emmons &amp; McCullough, 2003).</td>
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<tr>
<td>My emotions</td>
<td>What does this feeling mean?</td>
<td>Fredrickson et al., 2008;</td>
<td>General</td>
<td>Well-being</td>
<td>Active reflection</td>
<td>Teaching people to practice loving-kindness mediation—a contemplative practice designed to increase feelings of</td>
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<tr>
<td>Study</td>
<td>Type</td>
<td>Intervention</td>
<td>Description</td>
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<tr>
<td>Cohn &amp; Fredrickson, 2010</td>
<td>Supplementary</td>
<td>Exercise, on emotions</td>
<td>Warmth and caring for the self and others—in 6 hour-long sessions over 7 weeks caused increases in positive emotions, which mediated an increased sense of purpose in life, increased feelings of social support, and reduced illness symptoms. This in turn predicted increased life satisfaction and fewer depressive symptoms. Fifteen months after the program ended, about one in three participants reported continuing to mediate and those who did continued to report more positive emotions.</td>
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<tr>
<td>Hülsheger et al., 2012; see also Creswell, 2016</td>
<td>General</td>
<td>Work, well-being, Active reflection exercise, on emotions</td>
<td>Employees in diverse jobs took part in a 2-week intervention to teach them “mindfulness mediation and informal daily exercises [aimed] at cultivating an accepting, nonjudgmental attitude to what one experiences in each moment.” As compared to a no-treatment randomized control group, this reduced emotional exhaustion and increased job satisfaction over 10 work days.</td>
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<tr>
<td>Hülsheger et al., 2015</td>
<td>Specific</td>
<td>Work, Active reflection exercise, on emotions</td>
<td>Hairdressers learned about emotion-regulation techniques including “(a) reappraising difficult situations by considering that offensive client behavior is not meant as personal assault, but rather reflects the customer’s personal problems (reappraisal); (b) reappraising difficult situations by considering them a personal challenge and opportunity for growth (reappraisal); (c) putting themselves in the client’s shoes (perspective taking). To train attentional deployment, participants were encouraged to (d) trigger positive emotions by thinking of positive and enjoyable past or future events.” They then wrote down, on each of four consecutive mornings, how they could use these techniques in a “typical difficult situation with a customer” at work and, on each of 10 consecutive evenings, how they had done so, what was effective and how they could improve their use of the strategy. As compared to those in a control condition, hairdressers in the treatment condition earned higher tips over the 10 days.</td>
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<td>Ramirez &amp; Beilock, 2011</td>
<td>Specific</td>
<td>Education, Active reflection exercise, on a negative</td>
<td>9th-grade students given the opportunity to write down thoughts and feelings about the first final exam of high school immediately before taking the test earned higher scores if they were anxious about test-taking (B+ vs. B-).</td>
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<tr>
<td>My goals</td>
<td>When and how will I accomplish my goals? (Implementation intentions)</td>
<td>Chen et al., under review</td>
<td>Specific</td>
<td>Education</td>
<td>Active reflection exercise, on goals</td>
<td>Encouraging undergraduates to reflect on what learning resources would help them learn best—identifying specific resources, writing about why each resource they chose would be helpful, and creating a specific plan to use that resource—improved performance in an introductory statistics class by one-third of a letter grade. The effect was mediated by greater reflection students reported about their learning progress which, in turn, predicted greater reported effectiveness of learning resources.</td>
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<td>Christiansen et al., 2010</td>
<td>Specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>Chronic pain patients who, in addition to conventional care at an outpatient pain center, completed a 1-hour intervention focused on goal setting with regard to exercise. The intervention comprised (1) mental contrasting (listing positive aspects of exercising more and obstacles to this), (2) problem-solving to overcome these obstacles using a cognitive-behavioral approach, and (3) implementation intentions using “If…then…” statements (e.g., “If I am afraid of hurting myself, then I will remember that movement is good against pain”). As compared to patients who received only conventional care, those in the treatment condition had greater physical capacity along both behavioral measures and subjective ratings 3-weeks after discharge and 3-months after returning home.</td>
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<td>Duckworth et al., 2013; see also Duckworth et al., 2011</td>
<td>Specific</td>
<td>Education</td>
<td>Active reflection exercise, on goals</td>
<td>Asking urban 5th grade students to identify an important personal goal relevant to their school work and to write about obstacles that could prevent them from achieving this goal and what they would do if such obstacles arose following an “If…, then…” template (“mental contrasting with implementation intentions”), improved students’ grades, attendance, and classroom behavior that academic quarter.</td>
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<td>Harris et al., 2014</td>
<td>General and specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>[see Table S2]</td>
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<tr>
<td>Jessop et al., 2014</td>
<td>General and specific</td>
<td>Health</td>
<td>Active reflection</td>
<td>[see Table S2]</td>
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<tr>
<td>Authors</td>
<td>Domain</td>
<td>Setting</td>
<td>Intervention</td>
<td>Findings</td>
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<td>Leventhal et al., 1965</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by asking leading questions</td>
<td>College seniors learned about the importance of getting a tetanus shot in either a high or low fear condition. Regardless of this manipulation, giving seniors a map with the health center circled and asking students when would be a convenient time for them to go increased the percentage of students who got a tetanus shot from 3.3% to 27.6%.</td>
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<td>Milkman et al., 2011</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by asking leading questions</td>
<td>3,272 employees of a large utility company received mailers with information about upcoming flu shot clinics. Including a prompt to write down the date and time the employee would get the shot increased vaccination rates from 33.1% to 37.3%.</td>
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<td>Morisano et al., 2010</td>
<td>Specific</td>
<td>Education</td>
<td>Active reflection exercise, on goals</td>
<td>A series of online exercises in which struggling college students identified personal life goals and how they would implement these (i.e., goal-setting + implementation intentions) raised term GPA over the next four months, and reduced the percentage of students who ended the term less than full-time enrolled from 20% to 0%.</td>
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<tr>
<td>Nickerson &amp; Rogers, 2010</td>
<td>Specific</td>
<td>Civic Behavior</td>
<td>Prompting new meanings, by asking leading questions</td>
<td>Adding to a get-out-the-vote call script implementation intention questions—asking when a person would vote, where they would be coming from, and what they would be doing beforehand—increased turnout in a competitive presidential primary by 0.9%. (intention to treat) or 4.1% (average treatment on treated).</td>
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<tr>
<td>Pham &amp; Taylor, 1999</td>
<td>Specific</td>
<td>Education</td>
<td>Active reflection exercise, on goals</td>
<td>Undergraduates asked to mentally simulate the process for doing well on an exam (good study habits), as compared to those asked to simulate a positive outcome (getting a good grade) or those in a control condition, earned higher exam scores 1 week later. The intervention also increased planning, reduced anxiety, and increased studying.</td>
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<tr>
<td>Prestwich et al., 2005</td>
<td>Specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>Female undergraduates were asked to decide where and when they would perform a breast self-exam and to commit to doing so. This increased the number of breast self-exams women reported performing one and six months later. In a second study, women randomized to</td>
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<td>Authors</td>
<td>Type</td>
<td>Domain</td>
<td>Description</td>
<td>Example</td>
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<td>Prestwich et al., 2008</td>
<td>Specific</td>
<td>Health</td>
<td>Form implementation intentions were again more likely to perform breast self-exams over the next month. In addition, those who had a romantic partner and chose to have their partner perform the exam for them were especially likely to have performed a breast self-exam.</td>
<td>People who were both (1) exposed to information concerning the health risks of saturated food and (2) asked to make “If….then…” plans to avoid buying foods high in saturated fat (e.g., “If I’m in the supermarket then I will check the food labels of the product and not buy the product if the label says the food contains more than 1.5% saturated fat”) reported less consumption of saturated fat 1 month later. This effect was found relative to people who did neither (1) nor (2) and who did either but not both.</td>
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<tr>
<td>Prestwich et al., 2010</td>
<td>Specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>Adults asked to form specific plans about when they would walk briskly 5 days/week using the form “When I’m in situation X, then I will do Y” and who received text message reminders of either their walking goal or plan reported walking briskly for at least 30 minutes/day more than participants in a control condition over the next month.</td>
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<td>Sherman et al., 2010</td>
<td>Specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>Based on the theory that some forms of cognition are represented in the motor system, researchers theorized that the physical embodiment of health behaviors can promote those behaviors among people who intend to enact them. Among people who intended to floss, those who held floss while watching a video about the importance of flossing, instead of just watching the video flossed more over the next week. People who jogged in place while watching a video of a person exercising, as compared to those who just watched the video, exercised 16 minutes/day more over the next week.</td>
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<td>Stadler et al., 2009</td>
<td>Specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>Women received information about the benefits of exercise. Those in the “mental contrasting + implementation intentions” group also wrote down “(1) their most important current wish regarding physical activity (e.g., biking to work); (2) the most positive outcome of realizing their wish (e.g., getting into better shape) and events and experiences they associated with</td>
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<tr>
<td>What do I need to do to</td>
<td>Eskreis-Winkler et al., 2010</td>
<td>Specific</td>
<td>Health</td>
<td>Active reflection exercise, on goals</td>
<td>Adults received information about the role fruit and vegetables play in a healthy diet. Those in the “mental-contrasting + implementation intentions” group also were asked to write down “(a) their most important wish regarding their diet that should be both challenging and feasible (e.g., ‘eating more fruits and vegetables’); (b) the most positive outcome of realizing their wish (e.g., ‘greater wellbeing’) and events and experiences they associated with this positive outcome; (c) the most critical obstacle (e.g., ‘no fruits at work’) together with events and experiences they associated with this obstacle; and (d) formed three implementation intentions with the following questions: (1) ‘When and where does the obstacle occur, and what can I do to overcome or circumvent the obstacle?’; (2) ‘When and where is an opportunity to prevent the obstacle from occurring, and what can I do to prevent it from occurring?’; and (3) ‘When and where is a good opportunity for me to act in a goal-directed way, and what would this action be?’”. Both groups reported greater consumption of fruit and vegetables through four months later but only people in the mental-contrasting + implementation intentions group showed sustained higher intake two years later.</td>
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<tr>
<td>Question</td>
<td>Author(s)</td>
<td>Domain</td>
<td>Interventions and Description</td>
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<tr>
<td>What is necessary for me to accomplish my goals?</td>
<td>Destin &amp; Oyserman, 2010</td>
<td>Specific Education</td>
<td>Prompting new meanings, by providing new information Representing career success (e.g., earnings) as dependent on education led predominantly low-income, African American 7th graders to plan to work harder on homework and to be more likely to complete an extra-credit assignment that night (23% vs. 3%).</td>
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<tr>
<td>What were my goals?</td>
<td>Dal Cin et al., 2006</td>
<td>Specific Health</td>
<td>Prompting new meanings, by altering the situation Sexually active undergraduates who watched a video about the risks of unprotected sex—and who were given a “friendship” bracelet and told to remember the dangers of unprotected sex when they looked at it—were more likely to use a condom over the next 5-7 weeks during sex than those who just watched the safe sex video or an unrelated video. The effect was greatest when people had sex after drinking, a state in which people are especially responsive to situational cues.</td>
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<td>Is this goal my own or imposed?</td>
<td>Bryan, Yeager et al. 2016</td>
<td>Specific Health</td>
<td>Increasing commitment through action: Saying-is-believing Adolescents read about journalism exposing the deceptive and manipulative marketing practices of food companies and their harmful effects on society, especially to young children and the poor (e.g., formulating foods based on research designed to make it more addictive) as well as stories from older students describing their outrage about food company practices and efforts to “fight back against the companies by buying and eating less processed food.” They then wrote essays explaining why they were outraged and might fight back. As compared to a traditional public health message (conveying scientific information about how the body processes food, recommendations for a balanced diet, etc.), the “exposé” message, which connected with adolescents’ goals around autonomy and social justice,</td>
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<tr>
<td>My ability or potential</td>
<td>Self-efficacy</td>
<td>Bandura &amp; Schunk, 1981</td>
<td>Specific</td>
<td>Education</td>
<td>Direct labeling, of goals</td>
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<td>7-10-year-old children behind and with little interest in math were asked to complete instructional items with a proximal goal (6 pages/session). As compared to students assigned a distal goal (42 pages over 7 sessions) or no specific goal (“as many pages…as possible”), the proximal goal intervention increased students’ self-efficacy in math and learning.</td>
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<td>Sense of control</td>
<td></td>
<td>Langer &amp; Rodin, 1976; Rodin &amp; Langer, 1977</td>
<td>General</td>
<td>Health</td>
<td>Direct labeling, of a situation; Prompting new meanings, by altering the situation</td>
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<td>Nursing-home residents were told of their many responsibilities and choices and given a plant and told it was their responsibility to take care of it. As compared to a control-condition floor, this increased (at 3-weeks) residents’ self-reported happiness, activity level, and nurses’ judgment of improvement and (at 18-months) nurses’ rating of activity level, doctors’ rating of health, and reduced the mortality rate from 30% to 15%.</td>
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<td>Schulz, 1976; Schulz &amp; Hanusa, 1978</td>
<td>Specific but symbolic</td>
<td>Health</td>
<td>Prompting new meanings, by altering the situation</td>
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<td>Retirement-home residents were given the opportunity to control or to predict when a college student visitor would come visit them over a 2-month period, or received the same number and length of visits but without this predictability, or no visits. At 2-months, residents in the former conditions reported being happier and having more “zest for life” and were rated as being healthier and showed a smaller increase in the use of medications. Then the visits ended. At 42-months, residents in the former conditions were rated as having less “zest for live” and as less healthy and had a mortality rate of 20% as compared to 0% in the random-visit and no-visit conditions.</td>
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<tr>
<td>My behavior</td>
<td>Representation of potential behaviors</td>
<td>Detweiler et al., 1999; see also Rothman et al., 1993</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by providing new information</td>
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|                         |              |                        |          |           | Based on prospect theory, which suggests that people are risk-averse in the context of gains, the authors theorized that emphasizing “gains” rather than “losses” would promote prevention behaviors like sunscreen use. Beach goers were randomized to receive a brochure that highlighted the benefits of using sunscreen (e.g., “Protect yourself from the sun and you will help yourself stay healthy”) or the potential losses of not using sunscreen (e.g., “Expose yourself to the sun and you will risk..."
becoming sick”). Whereas 71% of those in the gain-frame condition redeemed a coupon to obtain a free sample of sunscreen, only 53% of those in the loss-frame condition did so. Additionally, those who did not intend to use sunscreen reported greater intentions to do so in the gain-frame than loss-frame condition.

<table>
<thead>
<tr>
<th>Study</th>
<th>Domain</th>
<th>Prompting</th>
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<tr>
<td>Garcia-Retamero &amp; Cokely, 2011</td>
<td>Specific Health</td>
<td>Prompting new meanings, by providing new information</td>
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<td>Sexualy active undergraduates read a brochure about sexually transmitted diseases. Following prospect theory, the authors hypothesized that (1) emphasizing gains rather than losses in describing a prevention behavior (condom use; e.g., “using condoms reduce[s] the chance of…contracting STDs” versus “not using condoms increase[s] the chance of…contracting a STD”) would promote compliance but (2) that emphasizing losses rather than gains in describing a detection behavior (screening; e.g., “not conducting screening reduce[s] the chance of receiving effective treatment” versus “screening increase[s] the chance of receiving an effective treatment”) would promote compliance. This was the case. Whereas ~65% of participants reported using condoms in every sexual encounter in the next six weeks in the gain-frame condition, only ~35% in the loss-frame condition did. For reports of making a screening appointment with a doctor, these numbers reversed. However, when the brochure included graphics depicting risk information, compliance rates were high overall and gain/loss framing did not matter.</td>
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<td>Feedback on ongoing behavior</td>
<td>Specific Environmen t</td>
<td>Prompting new meanings, by asking leading questions; Prompting new meanings, by providing new information</td>
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<td>People who reported how much they drove online every two days for two weeks reported driving less within this period and, after this period ended, less over the subsequent two weeks. In addition, people who received online feedback information about how much money (on gasoline and maintenance) and pollution they had saved by reducing their driving drove even less.</td>
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<td>Zohar, 2002;</td>
<td>Specific Work</td>
<td>Prompting</td>
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<tr>
<td>Providing supervisors in a regional maintenance center</td>
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focused on heavy-duty equipment weekly feedback on the cumulative frequency of subordinates’ reports of safety-related conversations with supervisors over 8 weeks, as well as communications of the priority put on safety by superiors, increased the frequency of safety-related conversations reported by subordinates and improved workplace safety, including frequency of ear plug use from 25% to 73%, up to 5 months after the intervention ended as compared to a randomized control group. In addition, whereas the microaccident rate (minor injuries that occurred due to unsafe behavior during work hours) increased in the control group over a three-month assessment period, it declined in the treatment group.

### Category B: Selves (In General)

<table>
<thead>
<tr>
<th>Nature of psychological qualities or states</th>
<th>Arousal</th>
<th>Stress</th>
<th>Implicit theories of willpower</th>
<th>Potential for psychological qualities or states to change/grow</th>
</tr>
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<tbody>
<tr>
<td>Jamieson et al., 2010; see also Brady et al., under review; Johns et al., 2008</td>
<td>Jamieson et al., 2010; see also</td>
<td>Crum et al., 2013</td>
<td>Job et al., in prep; see also Haimovitz et al., under review</td>
<td>Aronson et al., 2002; Blackwell et al., 2007; Good et al.,</td>
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<tr>
<td>Specific Education</td>
<td>General</td>
<td>General</td>
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<td>General</td>
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<td>Prompting new meanings, by providing new information</td>
<td>Prompting new meanings, by providing new information</td>
<td>Prompting new meanings, by providing new information</td>
<td>Increasing commitment through action: Saying-is-believing</td>
<td>Prompting new meanings, by providing new information</td>
</tr>
</tbody>
</table>
| Telling people preparing for the GRE that arousal “doesn’t hurt…and can actually help performance” improved scores on the math section of the GRE taken up to 3 months later. | Employees of a major financial services company who learned that stress can promote functioning and performance reported reduced symptoms of anxiety (headaches, insomnia) and greater improvement in “hard” and “soft” work skills (e.g., efficiency, communication) several days later. | College students learned that how you think about willpower—as dependent on a limited resource or not—matters, and that you can choose how to think about it, and wrote a letter of advice to a person who struggles with willpower. Among students who faced high demands on self-control this improved self-reported academic regulation a month later and raised end-of-term grades. | Diverse exercises to encourage students to view intelligence as malleable—as a quality that can grow with effort, effective strategies, and help from others rather than as a quality that is fixed—can raise achievement and reduce course failures especially among initially low-
<table>
<thead>
<tr>
<th>Implicit theories of groups</th>
<th>Halperin et al., 2011</th>
<th>General</th>
<th>Intergroup relations</th>
<th>Prompting new meanings, by providing new information</th>
<th>Encouraging Israeli Jews and Palestinians to view aggressive groups in general as capable of change led to more positive intergroup attitudes and increased willingness to compromise for peace.</th>
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<tbody>
<tr>
<td>Implicit theories of weight</td>
<td>Burnette &amp; Finkel, 2012</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by providing new information</td>
<td>People trying to lose weight were (1) led to view weight as changeable with effort (implicit-theories treatment); (2) received high quality information about scientifically validated means to lose weight (e.g., reduced pace of eating, mechanisms linking exercise to weight loss) (knowledge treatment); or (3) assigned to a control condition. Over a 12-week assessment period, both treatments prevented weight gain observed in the control condition. Additionally, whereas people in the knowledge treatment and control conditions gained more weight when they experienced more severe dieting setbacks (e.g., overeating at a party), those in the implicit-theories treatment lost more weight when they experienced greater setbacks.</td>
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<tr>
<td>Implicit theories of persons</td>
<td>Yeager et al., 2013</td>
<td>General</td>
<td>Education and health</td>
<td>Increasing commitment through action: Saying-is-believing</td>
<td>[see Table S3]</td>
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</tbody>
</table>

**Category C: Other People**

| Qualities of other individuals | Can other people learn and grow? | Rosenthal & Jacobson, 1968; see also Raudenbush, 1984 | Specific | Education | Direct labeling, of other people | Telling elementary-school teachers that a test administered at the beginning of the school year has identified certain children as “growth spurters” led to significantly greater intellectual growth in children, as measured by improved intelligence-quotient scores over... |
Wise Interventions: Supplementary Tables

The greatest effects were observed for children in first and second grades, and arise most when the teacher expectancies are established at the outset of the school year (Raudenbush, 1984).

<p>| Qualities of other groups | What are the experiences of people in other groups like? How is it like mine? How do we relate? | Aronson et al., 2016; see also Hodson et al., 2015 | Specific Intergroup relationships | Prompting new meanings, by providing new information | In samples of (1) predominantly White second- and third-grade children in the United States and (2) ethnically diverse 8-9-year-old Italian children, those who read 5-6 weekly storybooks including immigrant protagonists (Somali or African and Chinese) and relevant cultural information (e.g., religious holidays, food) reported greater interest in interacting with immigrant children 2-3 weeks after the intervention ended with the greatest effects among younger children (2nd-graders and 8-year-olds). The younger children in the US sample, also reported less anxiety about interacting with immigrant children up to 9-10 weeks later; the Italian sample, however, showed the opposite pattern for anxiety. |
| Broockman &amp; Kalla, 2016 | Specific Intergroup relationships | Prompting new meanings, by altering the situation | Having a 10-minute face-to-face conversation with a door-to-door canvasser about transgender rights, including reflecting on their own experiences being judged negatively for being different and how this might offer a window into the experiences of transgender people, reduced transphobia over 3 months and increased support for a nondiscrimination law even after exposure to counterarguments. |
| Cameron et al., 2006 | Specific Intergroup relationships | Prompting new meanings, by providing new information | White 5-11 year-old children in England were read three stories over two sessions, which represented close friendships between ingroup members and refugees. The stories emphasized the individual characteristics of refugees (decategories intervention), the common ingroup identity of refugees as a member of the school community (common ingroup identity intervention) or both the common ingroup identity and the unique subgroup identity of refugees (dual identity intervention). One to two weeks later, children in all three intervention conditions, as compared to a no-treatment control condition, reported a greater sense of connection to refugees and more positive attitudes toward refugees, with the dual identity intervention the most effective. However, there was no effect on children’s interest in |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Type</th>
<th>Intergroup relationships</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guerra et al., 2013</td>
<td>Specific</td>
<td>Intergroup relationships</td>
<td>9-11 year-old European and African Portuguese children worked together on a school-related activity in 45-minute weekly sessions for a month that was identified and functioned as either the “Portuguese team” (recategorization condition) or the “Portuguese team with Portuguese and African origin students” (dual identity condition). One month after the last interaction, African Portuguese children in the recategorization condition exhibited less bias against European Portuguese children as compared to both the dual identity condition and a no-treatment control condition in which students did not interact. European Portuguese children did not differ significantly by condition, but if anything the dual identity condition was more effective for them.</td>
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<tr>
<td>Liebkind &amp; McAlister, 1999</td>
<td>Specific</td>
<td>Intergroup relationships</td>
<td>Finish middle schools were randomized to a treatment in which students read stories of close friendships between prototypical Finnish students and immigrant students and how this improved Finnish students’ intergroup attitudes; heard support from university students for positive intergroup attitudes; and took part in brief discussion groups about intergroup relations. This treatment prevented a decline in students’ “tolerance” of immigrant students observed in control-condition schools 2-3 weeks later.</td>
</tr>
<tr>
<td>Shook &amp; Fazio, 2008</td>
<td>Specific</td>
<td>Intergroup relationships</td>
<td>White first-year college students randomly assigned an African American (versus White) roommate reported less satisfaction with their roommate relationship but showed reductions in automatic racial prejudice and intergroup anxiety over the first academic term of college.</td>
</tr>
<tr>
<td>Stathi et al., 2014</td>
<td>Specific</td>
<td>Intergroup relationships</td>
<td>White 7-9 year-old children in England imagined interacting with a different Asian child once a week for three weeks in routine settings (park, birthday party, beach). In each session, children received a picture of the Asian child and were prompted to tell a story “about a day that you might have with a new friend.” One week later, as compared to children in a no-treatment control condition, those who in the imagined contact condition reported being more similar to Asian children, more positive attitudes toward Asian children, and more</td>
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</tbody>
</table>
### How others view the self

| Am I loved and valued? | Marigold et al., 2007, 2010 | Specific but symbolic | Close relationships | Prompting new meanings, by asking leading questions | People were asked to recall a recent compliment from their romantic partner and to “Explain why your partner admired you. Describe what it meant to you and its significance for your relationship.” As compared to multiple control conditions, this led people with low self-esteem to feel more secure in the relationship and to value the relationship more immediately and over the next 2-3 weeks, to behave more positively toward their partner as reported by the partner, to see their partner as behaving more positively toward them, and to continue to feel more secure in and valuing of the relationship. |

| Am I viewed as a person with potential? | Yeager, Purdie-Vaughns et al., 2014, Experiments 1 and 2 | Specific | Education | Prompting new meanings, by altering the situation | Black and White 7th grade students turned in an essay, on which their teacher provided critical feedback. When a paper clipped note was appended to the marked-up essay reading, “I’m giving you these comments because I have high standards and I know that you can meet them,” this increased the percentage of White students who chose to revise their essay from 64% to 82%, and increased the percentage of Black students from 27% to 64%. In another study where a revision was required, this note increased the quality of students’ revisions. The greatest effects were observed for Black students who were mistrustful of school and, among these students, halted a 2-year decline in school trust over the rest of the school year. |

| Am I viewed through the lens of a negative stereotype? | Carrell et al., 2010; Dee, 2004; Huang, 2009 | Specific | Education | Prompting new meanings, by altering the | Performing in real-world contexts with in-group teachers and evaluators can improve performance, often especially for women and minorities, including women’s performance in college math and science classes with a... |
| Danaher & Crandall, 2008 | Specific | Education | Prompting new meanings, by altering the situation | High school students took the AP Calculus test with standard demographic questions (race, gender) moved to the end instead of immediately before the test. This raised girls’ scores, and increased the percentage of girls who received AP credit from 32% to 38%. |
| Good et al., 2008 | Specific | Education | Prompting new meanings, by providing new information | Women enrolled in demanding college calculus sequence took a practice final exam. When this exam was described as evaluative of calculus ability but as yielding “no gender differences,” as compared to when it was simply described as evaluative of ability, women and especially White women performed significantly better. |
| [multiple] | Specific | Education | Prompting new meanings, by altering the situation, by providing new information, or by asking leading questions | Diverse experiments show ways to reduce stereotype threat in laboratory settings, and to raise test performance for students who face negative intellectual stereotypes such as women in math and science and negatively stereotyped racial minority students on intellectual tasks in general. These include:  
• Reflecting on individual aspects of the self (Ambady et al., 2004; Gresky et al., 2005) or completing a value-affirmation exercise (Martens et al., 2006)  
• Learning about positive in-group role models (Marx & Goff, 2005; Marx & Roman, 2002; McIntyre et al., 2003)  
• Being treated by a man in a way that signals that he thinks of a woman as a partner working together on the test (Aguilar et al., under review)  
• Reflecting on characteristics shared between men and women (Rosenthal & Crisp, 2006)  
• Learning about stereotype threat and, thus, that negative thoughts and feelings may arise from this threat not imply a risk of poor performance (Johns et al., 2005) Learning effective emotion reappraisal strategies, such as to view anxiety as a potential source of strong performance not a hindrance, or to replace feelings of |
category D: past, ongoing, or future experiences

<table>
<thead>
<tr>
<th>Personal Experiences and Contexts</th>
<th>Of experiences that lack meaning</th>
<th>Grant, 2008</th>
<th>Specific</th>
<th>Work</th>
<th>Prompting new meanings, by providing new information</th>
<th>Providing employees reasons why their work was of value to others improved work performance. University fundraisers who read stories about how their job could make a difference in the lives of scholarship recipients raised more money over the next week. Lifeguards who read stories about lifeguards saving swimmers volunteered to work more hours and were rated by supervisors as more helpful of guests over the following month. These effects were observed above and beyond stories that emphasized the personal benefits of the job (e.g., skills and knowledge acquired).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harackiewicz et al., 2012</td>
<td>Specific</td>
<td>Education</td>
<td>Prompting new meanings, by providing new information</td>
<td>Mailing brochures to parents and creating a website highlighting the usefulness of math and science courses and how to talk with adolescents about this increased students’ enrollment in math and science courses in the last two years of high school.</td>
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<tr>
<td>Harackiewicz et al., 2016</td>
<td>Specific</td>
<td>Education</td>
<td>Prompting new meanings, by asking leading questions; Active reflection exercise, value-affirmation</td>
<td>Asking students in an introduction biology course to reflect on why “specific [course content] is relevant to your life or useful to you” raised the course grades of first-generation and racial-ethnic minority college students, reducing the achievement gap with advantaged students by 61%. Simultaneously, a value-affirmation intervention was not effective.</td>
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<tr>
<td>Hulleman &amp; Harackiewicz, 2009</td>
<td>Specific</td>
<td>Education</td>
<td>Prompting new meanings, by asking leading questions</td>
<td>Asking 9th-grade science students who expected to perform poorly how the course material might be useful to them or a friend or relative 3-5 times over the course of the term raised end-of-quarter interest and grades in science for students who expected to perform poorly in the course.</td>
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<td>Jang, 2008</td>
<td>Specific</td>
<td>Education</td>
<td>Prompting new meanings, by</td>
<td>Teaching students training to be teachers that an introductory statistics lesson helps people become more effective teachers increased engagement and learning in</td>
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<tr>
<td>Of how experiences affect the self</td>
<td>Benedetti et al., 2003</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Making the injection of drugs visible rather than invisible to patients increased their effectiveness, including greater reductions in pain from morphine, greater reductions in anxiety from diazepam, and greater reductions in heart rate from propranolol.</td>
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<td>Crum &amp; Langer, 2007</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by providing new information</td>
<td>Telling hotel room attendants that cleaning hotel rooms meets the Surgeon General’s recommendations for an active lifestyle reduced attendants’ weight, systolic blood pressure, and percent body fat and increased their job satisfaction four weeks later.</td>
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<td>Kaptchuk et al., 2010</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by providing new information</td>
<td>Telling patients with irritable bowel syndrome that a pill they are to take twice daily contains no medication (i.e., is a placebo) but that the placebo effect is powerful and can lead the body to respond effectively led, as compared to a no-pill condition, to greater improvement, and reduced symptoms at three weeks. At this point, 59% of treated patients, as compared to 35% of control patients, reported adequate relief.</td>
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<td>Of aversive experiences</td>
<td>Kross et al., 2014; see also Kross &amp; Ayduk, 2011; Kross et al., 2005; Park et al., 2015</td>
<td>Specific</td>
<td>Well-being</td>
<td>Active reflection exercise, on negative experiences</td>
<td>Asking people to write about a negative event from a third-person perspective as if they were a fly on the wall observing it, using a third- and specifically to describe why the event occurred the way it did (e.g., “Greg failed a test”), as compared to writing about the event from a first-person perspective (e.g., “I failed a test”), made people more likely to interpret the event in a non-pejorative way, to stop ruminating on it, and to experience less psychological distress.</td>
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<td>Pennebaker et al., 1988; see also Pennebaker, 1997; Kirk et al., 2011</td>
<td>Specific</td>
<td>Health and well-being</td>
<td>Active reflection exercise, on negative experiences</td>
<td>Asking people to describe their “deepest thoughts and feelings” about “the most traumatic and upsetting experiences of your entire life” for 20 minutes/day on four consecutive days improved measures of immune system function and reduced doctor visits and subject distress over six weeks.</td>
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<td>Redelmeier et al., 2003</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by</td>
<td>Based on the theory that people’s evaluations of experiences are disproportionately shaped by the end of experiences, modifying a colonoscopy by leaving the tip</td>
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<td>Of setbacks</td>
<td>Boese et al., 2013; Hall et al., 2004, 2006, 2007; Haynes et al., 2006; Menec et al., 1994; Perry &amp; Penner, 1990; Perry et al., 2010; Ruthig et al., 2004</td>
<td>General Education</td>
<td>Prompting, by providing new information; Direct labeling, of attributions; Increasing commitment through action: Saying-is-believing</td>
<td>Across many studies, college students were exposed to information that failures arise from a lack of effort and inappropriate strategies and that increasing effort and changing strategies can improve outcomes. This represents effort and strategies as under a person’s control. Often this information is provided in videotaped interviews of other students and/or of professors telling stories from their own lives. Often it includes an explicit discussion of attribution theory and why attributions matter, and a direct exhortation to students to attribute setbacks to a lack of effort (and success to ability and effort) (e.g., Perry &amp; Penner, 1990; Perry et al., 2010). Some forms also incorporate writing exercises to help students articulate the idea for themselves and relate them to their own lives (e.g., Boese et al., 2013; Hall et al., 2004, 2007; Haynes et al., 2006) or small-group discussions (Boese et al., 2013; Perry et al., 2010; Ruthig et al., 2004). These “attributional retraining” interventions can improve learning and performance, especially for students who are struggling and who otherwise tend to attribute poor performance to limited ability (Boese et al., 2013; Menec et al., 1994; Perry &amp; Penner, 1990; Perry et al., 2010) or who are overly optimistic (Haynes et al., 2006; Ruthig et al., 2004), with improvements in GPA that can last at least a full academic year (Hall et al., 2004; Perry et al., 2010; Ruthig et al., 2004).</td>
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</table>

<p>| Weinberg et al., 2015 | General Health | Prompting, by providing new information | Older adults (80+) in a rehabilitation center who received information encouraging “personally controllable attributions for loss of function (e.g., effort invested in exercise protocols) and discouraging maladaptive attributions (e.g., ‘old age’)” were more motivated to exercise, reported higher life satisfaction, and exhibited greater function |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Type</th>
<th>Intervention</th>
<th>Description</th>
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<tbody>
<tr>
<td>Destin &amp; Oyserman, 2009</td>
<td>Specific Education</td>
<td>Prompting new meanings, by providing new information</td>
<td>Representing college as accessible by providing information about need-based financial aid to low-income African American and Latino 7th-grade students led students to be more likely to plan to do their homework that night.</td>
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<td>Stephens et al., 2014</td>
<td>General Education</td>
<td>Prompting new meanings, by providing new information</td>
<td>A panel discussion that provided first-generation college students information about how students’ social-class backgrounds affect their experiences in college, including unique challenges faced by first-generation students and how students overcome these with time, as compared to a panel discussion that did not link college experiences to students’ social-class background, reduced the social-class achievement gap in first-year GPA among students at a selective college by 63%.</td>
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<td>Good et al., 2003</td>
<td>General Education</td>
<td>Prompting new meanings, by providing new information</td>
<td>7th grade students in a rural, low-income, and predominantly Hispanic and Black population were matched with a college student mentor with whom they had two in-person 90-minute meetings plus email exchanges. In a treatment condition, the mentor shared that many students experience difficulties in the transition to junior high school but bounce back as they get used to their new environment (e.g., changing classes, more difficult subjects, many teachers not one). As compared to a randomized control condition, girls (but not boys) earned higher math scores on a state test while both girls and boys earned higher reading scores.</td>
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<td>Wilson &amp; Linville, 1982, 1985</td>
<td>General Education</td>
<td>Prompting, by providing new information; Increasing commitment through action: Saying-is-believing</td>
<td>First-year undergraduates worried about their academic performance viewed videos of upper-year students describing difficulties they experienced in their first year and how these improved with time. In some cases, students also wrote essays to high school students describing why academic difficulties in the transition to college are normal and temporary. This reduced sophomore-year dropout rates (in one trial, from 25% to 5%) and raised GPA.</td>
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<tr>
<td>Walton &amp; Cohen, 2011</td>
<td>General Education, health, and well-being</td>
<td>Increasing commitment through</td>
<td>[see Table S3]</td>
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<tr>
<td>Social Experiences</td>
<td>Interpersonal relationships and conflicts</td>
<td>Bugental et al., 2002; Bugental et al., 2010, 2012</td>
<td>Specific</td>
<td>Parenting</td>
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<tr>
<td>Intervention</td>
<td>Specificity</td>
<td>Domain</td>
<td>Intervention Type</td>
<td>Description</td>
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<tr>
<td>LaBrie et al., 2016; see also Turrisi et al., 2001, 2010</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by providing new information; Active reflection, on</td>
<td>Parents of new college students learned in a 60-minute in-person session during the summer before college began about college drinking, including how they as a group tend to “overestimate how accepting other parents are of drinking,” “underestimate the extent to which other parents speak to their children about alcohol,” and “underestimate how much their child would drink in college,” as well as research showing parents’ ongoing influence on students’ drinking in college and strategies to speak with their child about college drinking effectively, reduced students’ reports of the extent to which they drank in the first month of college by 30% as compared to a randomized control group. Using a non-randomized comparison group, Turrisi et al. (2001, 2010) found similar reductions in first-year college student drinking from a 35-page handbook distributed to parents.</td>
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<td>Intergroup relationships</td>
<td>Carnes et al., 2015</td>
<td>General</td>
<td>Intergroup relationships</td>
<td>An implicit-bias reduction program modeled on Devine et al. (2012) but focused on gender bias was randomized to math, science, and engineering departments. Over 3 days and 3 months, the intervention did not reduce bias among faculty, but it did raise awareness of and motivation to remedy bias, improved faculty members’ sense of fit and respect in the department, and, when at least a quarter of department faculty attended the program, increased self-reported actions to promote gender equity. In another study this program increased faculty hiring of women in math, science, and engineering departments (Forscher, 2016)</td>
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<tr>
<td>Devine et al., 2012; see also Forscher et al., under review</td>
<td>General</td>
<td>Intergroup relationships</td>
<td>Prompting new meanings, by providing new information</td>
<td>Non-African American undergraduates learned about implicit bias, its link to discrimination, and strategies to reduce bias in daily life (e.g., recognizing and replacing stereotypic responses, imagining counterstereotypical outgroup members. This led to a decline in implicit prejudice that lasted through two months and an increase in concern about discrimination. A replication study (Forscher et al., 2012) found no reduction in implicit prejudice over two weeks but sustained increases in</td>
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A subsample recruited two years later showed that treated participants were more likely to object in an online forum to an essay endorsing racial stereotyping (79% vs. 48%).

<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Goal</th>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wise Interventions:</td>
<td>Mallett &amp; Wilson, 2010</td>
<td>General Intergroup relationships</td>
<td>Increasing commitment through action: Saying-is-believing</td>
<td>Undergraduates watched a video depicting a friendship between a Black and a White student. Both friends mentioned that they did not expect to become friends or have much in common. As compared to students who just watched the video, students who then wrote about “a time when you didn’t think you could become friends with a person, but were wrong for some reason” had a better interracial interaction immediately and initiated more interracial friendships in the next two weeks.</td>
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<td>The Non-Social World</td>
<td>Au et al., 2008</td>
<td>Specific Health</td>
<td>Prompting new meanings, by providing new information</td>
<td>Teaching 4th-grade children in Hong Kong following the 2003 SARS epidemic the biological theory of germs, challenging the traditional folk theory that being cold causes colds, increased the percentage who washed their hands before folding napkins for a class party from 14% to 41%. The effects were observed above and beyond a teacher-designed program based on publicly available resources, which emphasized the symptoms of flus, do’s and don’ts, etc.</td>
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<tr>
<td>Gripshover &amp; Markman, 2013</td>
<td>Specific Health</td>
<td>Prompting new meanings, by providing new information</td>
<td>Teaching preschool-aged children a theory of nutrition—that variety is important because different foods contain different nutrients, that nutrients are there even if you can’t see them, and that foods within a category share similar nutrients—led children to take more vegetables at snack time.</td>
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</table>
### Table S2. Wise interventions approach #2: Interventions that address the need for self-integrity.

<table>
<thead>
<tr>
<th>Threat Addressed</th>
<th>Reference</th>
<th>Specificity of Intervention</th>
<th>Content Area</th>
<th>Change Strategy</th>
<th>Summary</th>
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</thead>
<tbody>
<tr>
<td>Social identity threat: Will I be seen or treated negatively because of my group identity?</td>
<td>Cohen et al., 2006, 2009; see also Borman et al., 2015; Bowen et al., 2013; Cook et al., 2012; Dee, 2015; Goyer, Garcia et al., under review; Hanselman et al., 2014; Sherman et al., 2013</td>
<td>General</td>
<td>Education</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Completing several 15-20 minute writing exercises about important values over the school year increased African American middle students’ course grades, reducing the racial achievement gap by 40% (Cohen et al., 2006), and improving grades over the next two years, especially for initially low-performing students (Cohen et al., 2009; see also Cook et al., 2012). Similar benefits have been found for Latino students (Sherman et al., 2013). Moreover, six years after the original intervention, African American students who had received the affirmation were more likely to enroll in college (92% versus 78%; Goyer, Garcia et al., in prep). A full-district administration found reductions in the Black-White achievement gap (Borman et al., 2015); in one case especially in schools in which African American students were less well represented and where the achievement gap was highest, where identity threat may be highest (Hanselman et al., 2014; but see also Dee, 2015).</td>
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<td>Brady et al., 2016; Harackiewcz et al., 2014, 2015; Miyake et al., 2010; Tibbetts et al., 2016</td>
<td>General</td>
<td>Education</td>
<td>Active reflection exercise, value-affirmation</td>
<td>In college samples, value-affirmation interventions have raised women’s grades in physics, eliminating gender differences (Miyake et al., 2010); raised grades in biology among first-generation college student, reducing the social-class achievement gap by 50%, as well as raising term GPA, and increasing the percentage of first-generation students who enrolled in the second semester of the course from 66% to 86% (Harackiewcz et al., 2014; but see Harackiewcz et al., 2015) and caused improvements in first-generation students’ college GPA over the next three years (Tibbetts et al., 2016); and raised GPA among Latino American students over two years, reducing the ethnic achievement gap by 90% (Brady et al., 2016).</td>
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<td>Hall et al., 2014</td>
<td>General</td>
<td>Poverty</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Clients at a soup kitchen scored higher on IQ and cognitive-control tasks and were more likely to accept information about public benefit programs if they first described a personal success.</td>
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<td></td>
<td>Silverman &amp;</td>
<td>General</td>
<td>Education</td>
<td>Active reflection</td>
<td>Blind students in a compensatory skill-training program made</td>
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<tr>
<td>Study</td>
<td>Category</td>
<td>Domain</td>
<td>Exercise</td>
<td>Affirmation</td>
<td>Description</td>
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<tr>
<td>Cohen, 2014</td>
<td></td>
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<td>exercise, value-affirmation</td>
<td>more progress in four courses (Braille, computers, home management, and travel) over a month if they had completed a value-affirmation.</td>
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<tr>
<td>Walton, Logel et al., 2015</td>
<td>General</td>
<td>Education</td>
<td>Increasing commitment through action: Saying-is-believing</td>
<td>Encouraging women enrolled in male-dominated engineering majors to “keep balanced” by incorporating personal values in their daily lives and activities (“affirmation-training”) raised grades and eliminated gender differences in first-year engineering performance.</td>
<td></td>
</tr>
<tr>
<td>Stressful event: Will this go badly?</td>
<td>Sherman, Bunyan, et al., 2009</td>
<td>General</td>
<td>Stress and health</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Completing two value-affirmation exercises in the weeks preceding a major test reduced levels of stress hormones as the test approached.</td>
</tr>
<tr>
<td>Self-regulation: Can I regulate my behavior effectively to accomplish important personal goals?</td>
<td>Logel &amp; Cohen, 2012</td>
<td>General</td>
<td>Self-regulation and health</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Completing a value-affirmation exercise led overweight women to lose more two-and-a-half months later, and show evidence of enhanced self-regulation.</td>
</tr>
<tr>
<td>Health information: Am I doing something that is harming my health?</td>
<td>Armitage et al., 2011</td>
<td>General</td>
<td>Health</td>
<td>Active reflection exercise, value-affirmation and implementation of value-affirmation</td>
<td>Adults (1) who described times they had behaved kindly toward others or (2) who reflected on how to affirm using if-then propositions (“If I feel threatened or anxious, then I will…think about the things I value about myself…I think about things that are important to me…”) were more accepting of information about the health risks of drinking and, a month later, reported drinking less.</td>
</tr>
<tr>
<td></td>
<td>Harris et al., 2007</td>
<td>General</td>
<td>Health</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Smokers who first reflected on their desirable characteristics were more accepting of information about the health risks of smoking. They also reported greater motivation to reduce consumption 1-week later but no change in reported consumption.</td>
</tr>
<tr>
<td></td>
<td>Harris et al., 2014</td>
<td>General</td>
<td>Health</td>
<td>Active reflection exercise, value-affirmation; Active reflection exercise, on goals</td>
<td>Adults who both reflected on personal values before reading information about the benefits of eating fruits and vegetables and who made a plan about how to do so using an “If…then…” template reported eating more fruit and vegetables 7 days later; there was no benefit for either intervention on its own. At a 3-month follow-up, both the affirmation intervention and the implementation-intention intervention produced independent (non-interacting) increases in reported fruit and vegetable consumption, though the later was marginally significant.</td>
</tr>
<tr>
<td><strong>Negative relationships:</strong> Can I get along with important people in my environment?</td>
<td>Layous et al., 2016</td>
<td>General</td>
<td>Education</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Mostly first- and second-year college students completed a value-affirmation or control exercise immediately before taking a challenging math test described as predictive of future success. Among those who felt they did not belong in college, the value-affirmation reversed a downward slope in GPA through the subsequent semester.</td>
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</tr>
<tr>
<td>Stinson et al., 2011</td>
<td>General</td>
<td>Interpersonal relationships</td>
<td>Active reflection exercise, value-affirmation</td>
<td>College students who felt insecure in their personal relationships felt more secure in their relationships and showed more confident social behavior 2-4 weeks after a value-affirmation, and this contributed to similar improvements another 4 weeks later.</td>
<td></td>
</tr>
<tr>
<td>Thomaes et al., 2012</td>
<td>General</td>
<td>Prosocial behavior</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Adolescents, especially those who were more antisocial at baseline, showed greater prosocial feelings and behavior over a 3-month period following a value-affirmation.</td>
<td></td>
</tr>
<tr>
<td>Thomaes et al., 2009</td>
<td>General</td>
<td>Aggression</td>
<td>Active reflection exercise, value-affirmation</td>
<td>Narcissistic adolescents with low self-esteem who completed a value-affirmation were less likely to be nominated by peers as aggressive in the subsequent week.</td>
<td></td>
</tr>
</tbody>
</table>

**Strategy B. Leverage a potential threat of inconsistency**

<p>| Did I work hard at this because it’s important to me? | Axsom &amp; Cooper, 1985 | Specific | Health | Increasing commitment through action: Effort justification | Overweight undergraduates were told that various perceptual and cognitive tasks they would complete over four experimental sessions would enhance “neuro-physiological arousal” and help them lose weight. Those for whom the tasks required high effort (distinguishing similar limes, reciting text as their voice echoes back) lost an average of 6 pounds a year later. By contrast, students for whom the tasks were easy, short, and included breaks and those in a control condition lost no weight. |
| Am I advocating for something I don’t (yet) do myself? | Rokeach, 1971 | General | Intergroup | Prompting new meanings, by providing new information; | Undergraduates in the 1960s were asked to rank their values and typically ranked “freedom” over “equality.” Some were told that this ranking meant that people valued freedom for themselves more than freedom for other people, and further |</p>
<table>
<thead>
<tr>
<th>Source</th>
<th>Specific</th>
<th>Domain</th>
<th>Increasing commitment through action: Hypocrisy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Son Hing et al., 2002</td>
<td>Specific</td>
<td>Intergroup</td>
<td>Increasing commitment through action: Hypocrisy</td>
<td>Undergraduates first advocated a nonprejudicial stance toward Asians and then, in the hypocrisy condition, wrote “about two situations in which you reacted more negatively to an Asian person than you thought you should or treated an Asian person in a prejudiced manner.” As compared to those who did not complete the hypocrisy induction, people in the hypocrisy condition with low implicit but high explicit prejudice against Asians felt more guilt and discomfort and, subsequently, advocated smaller cuts to the Asian Student Association. There was no condition difference for people low in implicit and explicit prejudice.</td>
</tr>
<tr>
<td>Stone et al., 1994</td>
<td>Specific</td>
<td>Health</td>
<td>Increasing commitment through action: Hypocrisy</td>
<td>Sexually active undergraduates were led to feel hypocritical about their own safe sex practice by (a) helping to create an AIDS prevention program for high school students and (b) reviewing circumstances in which they personally had failed to use condoms. This led 83% of students to subsequently purchase condoms. By contrast, just 33-50% of students who did neither (a) nor (b) or either but not both purchased condoms.</td>
</tr>
<tr>
<td>Dholakia &amp; Morwitz (2002)</td>
<td>Specific</td>
<td>Business</td>
<td>Increasing commitment through action: Commitment</td>
<td>Customers of a financial services firm were randomized to receive a telephone survey assessing satisfaction with the company; 96% reported being satisfied. As compared to customers not surveyed, this increased the percentage who opened a new account over the next year from 13% to 51%, and reduced unprofitability/customer from $13.80 to $1.20.</td>
</tr>
<tr>
<td>Greenwald et al. 1987; see also Nickerson &amp; Rogers, 2010; Smith et al., 2003</td>
<td>Specific</td>
<td>Civic behavior</td>
<td>Increasing commitment through action: Commitment</td>
<td>College undergraduates were called just before the 1984 Presidential election and asked if they knew where and when to vote. Those who were also asked if they expected to vote were more likely to vote (87% vs. 62%) (for non-replications, see Nickerson &amp; Rogers, 2010; Smith et al., 2003)</td>
</tr>
<tr>
<td>Gringart et al., 2008</td>
<td>Specific</td>
<td>Intergroup</td>
<td>Increasing commitment through action:</td>
<td>Australian hiring managers received letters emphasizing (1) common stereotypes about older workers and empirically based counter evidence and (2) information about hiring</td>
</tr>
</tbody>
</table>

Wise Interventions: Supplementary Tables  28
Commitment discrimination against older workers, how this violates national norms, and a booklet with names of hiring managers who oppose age discrimination, and an invitation to add their own name to this list to be distributed to the broader community. As compared to hiring managers who received only (1) or (2) or neither, those who received both reported over the next few weeks expressed more positive views of older workers, a greater preference for hiring older workers, and being more likely to hire older workers.

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Specificity</th>
<th>Category</th>
<th>Intervention</th>
<th>Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lewin, 1947</td>
<td>Specific</td>
<td>Civic behavior</td>
<td>Prompting new meanings, by altering the situation</td>
<td>[see Table S3]</td>
<td></td>
</tr>
<tr>
<td>Moriatry, 1975</td>
<td>Specific</td>
<td>Crime</td>
<td>Increasing commitment through action: Commitment</td>
<td>Beach goers asked to watch another person’s belongings were more likely to chase after an accomplice who attempted to steal a radio (94% vs. 20%).</td>
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</tr>
<tr>
<td>Shu et al., 2012</td>
<td>Specific</td>
<td>Civic behavior</td>
<td>Increasing commitment through action: Commitment</td>
<td>Policy owners received a car insurance form on which to report the number of miles they had driven in the previous year. Those for whom the signature line (“I promise that the information I am providing is true”) was at the top rather than the bottom disclosed having driven 10% more miles (26,098 vs. 23,671), increasing payments and promoting fairness.</td>
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</tr>
<tr>
<td>Aronson &amp; Osherow, 1980</td>
<td>Specific</td>
<td>Education, Intergroup relationships</td>
<td>Restructured newly desegregated 5th grade classrooms to feature jigsaw groups, in which each child learns a portion of an assignment, has to teach and learn from other students, and then is tested on the whole. This procedure encourages cooperation rather than competition, requires children to behave in ways that are inconsistent with negative intergroup attitudes, and meet’s classic conditions for successful intergroup contact (sanctioned by authority, equal status, intergroup cooperation, common goals) (Allport, 1954). The procedure caused students to like each other more within and across ethnic lines, raised students’ self-esteem, led White and African American children (but not Latino children) to like school more, and improved academic test performance among African American and Latino children.</td>
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<tr>
<td>Brannon &amp; Walton, 2013</td>
<td>Specific but symbolic</td>
<td>Intergroup relationships</td>
<td>Increasing commitment through action:</td>
<td>White and Asian undergraduates had a positive interaction with a Mexican American student. When they (1) were led to feel socially connected to this student, disposing them to...</td>
<td></td>
</tr>
</tbody>
</table>
share her interests; and (2) had the opportunity to freely work with her to design a Mexican cultural product (a music video for a Mexican band), giving them an opportunity to enact an interest in Mexican culture, students showed reduced levels of implicit prejudice against Latinos. This was mediated by greater engagement in the Mexican cultural task. Also, an average of 6-months later, they reported greater interest in talking with Mexican American peers and more positive attitudes toward Mexican immigrants.
**Table S3.** Wise interventions approach #3: Interventions that address the need to belong.

<table>
<thead>
<tr>
<th>Strategy A. Satisfy or Remedy Threats to People’s Need to Belong</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Social recognition</td>
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<tr>
<td>Bolster existing social relationships</td>
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<tr>
<td>Reflect on social connections</td>
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<td></td>
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<tr>
<td>Value contributions to a group</td>
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<tr>
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</tr>
<tr>
<td>Challenge perceived norms to expand the scope of what behavior is acceptable</td>
</tr>
<tr>
<td>Schroeder &amp; Prentice, 1998; see also DeJong et al, 2006, 2009</td>
</tr>
</tbody>
</table>
Wise Interventions: Supplementary Tables  33

<table>
<thead>
<tr>
<th>Remedy beliefs and experiences that undermine relationships, belonging, and have downstream effects</th>
<th>Encourage beliefs that people in conflicts can change</th>
<th>Yeager et al., 2013; see also Miu &amp; Yeager, 2015; Yeager, Johnson, et al., 2014</th>
<th>General</th>
<th>Education and health</th>
<th>Increasing commitment through action: Saying-is-believing</th>
<th>Adolescents who learned in a 6-session classroom workshop that people can change and, thus, that bullies need not always be bullies and victims need not always be victims, were less aggressive and more prosocial following peer ostracism one month later; three months later victims of peer bullying were more likely to be nominated by teachers as showing reduced conduct problems and showed fewer depressive symptoms. Another trial found less negative immediate reactions to a social adversity and, over 8 months, lower overall stress, reduced physical illness, and better academic achievement. A third found a 40% reduction in clinically significant depressive symptoms at 9 months.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedy the worry that, “Maybe people like me don’t belong here.”</td>
<td>Walton &amp; Cohen, 2011; see also Brady et al., in prep B;</td>
<td>General</td>
<td>Education, health, and well-being</td>
<td>Increasing commitment through action: Saying-is-believing</td>
<td>Students in the transition to college read stories from ethnically diverse older students that conveyed that it is normal to worry at first about whether you belong in college and this improves with time. They then wrote an essay describing</td>
<td></td>
</tr>
</tbody>
</table>
Wise Interventions: Supplementary Tables

<p>| Murphy et al., in prep; Walton &amp; Cohen, 2007; Walton, Logel, et al., 2015; Yeager, Walton, et al., 2016 | how this process was true for them and delivered this as a speech to a video camera to help future students in their transition. This led African American students to engage more in the academic environment (e.g., emailing professors, meeting with study groups) and increased their grade-point-average over the next three years through the end of college, reducing the achievement gap with White students by 50%. At this point, African American students also reported greater confidence in their belonging, being happier, and being healthier (Walton &amp; Cohen, 2011). Follow-up surveys find that the intervention, delivered in the first year of college, improved African American graduates’ life and career satisfaction at the age of 25-27, an effect that was mediated by greater reported mentorship in college (Brady et al., in prep B). In other trials, adapted versions of the intervention raised women’s first-year grades in male-dominated engineering fields, eliminating gender differences (Walton, Logel et al., 2015); increased the percentage of racial minority and first-generation students at a large, broad-access institution who maintained continuous full-time enrollment over two years by 9 percentage points (Murphy et al., in prep); and, when delivered online to full institutional cohorts prior to college matriculation, improved first-year outcomes for racial minority and first-generation students, for instance increasing the percentage of African American first-generation college student graduates from urban charter schools who took a full course load the first year of college from 32% to 41% (Yeager, Walton et al., 2016). |
| Goyer, Cohen, et al., under review | General Education | Increasing commitment through action: Saying-is-believing | An adapted version of the social-belonging intervention (Walton &amp; Cohen, 2011) delivered to African American and White students at the outset of middle school reduced disciplinary citations among African American boys through... |</p>
<table>
<thead>
<tr>
<th>Study Title</th>
<th>Study Type</th>
<th>Study Setting</th>
<th>Intervention Description</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wise Interventions: Supplementary Tables</td>
<td>35</td>
<td>the end of high school by 64%, reducing the gap with White boys by 83%. The intervention seemed to cut off a cycle of mistrust and negative interactions between African American boys and teachers in 6th and 7th grades as evidenced by an increasing rate of citations for incidents requiring subjective judgment within the school year in the control condition only. Additionally, the intervention reduced uncertainty about belonging over the course of middle school for African American boys, and protected their level of belonging and forestalled the emergence of high levels of stereotype threat at the end of 7th grade and into 8th grade.</td>
<td></td>
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</tr>
<tr>
<td>Shook &amp; Clay, 2012</td>
<td>General</td>
<td>Education</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Ethnic-minority first-year students at a predominantly White university randomly assigned a White (versus ethnic-minority) roommate reported a greater sense of belonging at the university over the first semester and this mediated higher first-year GPA.</td>
</tr>
<tr>
<td>Remedy experiences that signal nonbelonging</td>
<td>Specific</td>
<td>Education</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Revising the letter sent to college students to place them on academic probation to mitigate shame and stigma students perceived—by framing probation as a process not a label, communicating “you’re not the only one,” acknowledging specific, valid reasons students can struggle in college, and offering hope for returning to good standing—increased the percentage of students who returned to good standing a year later from 26% to 43% and the percentage who were still enrolled (had not dropped out or been suspended) from 48% to 79%.</td>
</tr>
<tr>
<td>Replace a punitive with an empathic mindset about student misbehavior</td>
<td>Specific</td>
<td>Education</td>
<td>Increasing commitment through action: Saying-is-believing</td>
<td>Two online exercises encouraging middle-school teachers to take on an empathic rather than punitive mindset about student misbehavior—to understand misbehaving students’ experience and perspective, to sustain positive relationships, and to work with students to improve behavior—reduced suspension rates among students by 50%.</td>
</tr>
<tr>
<td>Create new social relationships and groups that leverage behavior change</td>
<td>Form teams to support goal pursuit</td>
<td>Prestwich et al., 2005</td>
<td>Specific</td>
<td>Health</td>
</tr>
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</tr>
<tr>
<td>Prestwich et al., 2012</td>
<td>Specific</td>
<td>Self-regulation and health</td>
<td>Prompting new meanings, by asking leading questions</td>
<td>Adults were asked to form collaborative implementation-intentions to exercise more. They read, “Past research suggests that despite intending to undertake regular physical activity, many people fail to do so. To give yourself the best chances of succeeding, it seems that it can be helpful to make a very specific plans with a partner (e.g., husband, wife, girlfriend, boyfriend, housemate, etc.) about how together you will go about increasing the amount of regular physical activity you do” and then completed “If…then…we” statements. As compared to participants in a control condition, in a personal implementation intentions condition, and in a partner but no implementation intentions condition, those in the collaborative implementation-intentions condition engaged more frequently in physical activity one and six months later and reported losing more weight six months later.</td>
</tr>
<tr>
<td>Spiegel et al., 1989</td>
<td>Specific</td>
<td>Health</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Providing women with metastatic breast cancer a weekly support group including self-hypnosis for pain increased mean survival time from 18.9 months to 36.6 months.</td>
</tr>
<tr>
<td>Wing &amp; Jeffery, 1999; see also Leahey et al., 2012</td>
<td>Specific</td>
<td>Self-regulation and health</td>
<td>Prompting new meanings, by altering the situation</td>
<td>People trying to lose weight were randomized to a standard behavioral treatment (weekly group meetings over 16 weeks) or this treatment with social support: 4-person teams in which each person supported the others’ efforts to lose weight. Although all participants lost weight over the 4-month treatment with no difference by</td>
</tr>
<tr>
<td>Facilitate intergroup relationships to promote positive intergroup attitudes</td>
<td>Page-Gould, et al., 2008</td>
<td>Specific but symbolic</td>
<td>Intergroup relationships</td>
<td>Prompting new meanings, by altering the situation</td>
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</tr>
<tr>
<td>Facilitate important social relationships</td>
<td>Learn about the personal qualities of other people</td>
<td>Bowen et al., 2013</td>
<td>Specific</td>
<td>Education</td>
</tr>
<tr>
<td></td>
<td>Gehlbach et al. 2016</td>
<td>Specific</td>
<td>Education</td>
<td>Provider teachers essays written by middle-school students about their personal values, as compared to students who wrote similar essays but which were not provided to their teachers, raised year-long grades among a sample of primarily African American and low-income students.</td>
</tr>
<tr>
<td>Receive expressions of gratitude</td>
<td>Grant &amp; Gino, 2010</td>
<td>Specific</td>
<td>Work</td>
<td>Prompting new meanings, by altering the situation</td>
</tr>
</tbody>
</table>
| Leverage prosocial motivations | Represent a behavior as a means to connect | Fotuhi et al., 2014 | Specific | Health | Active reflection exercise, goal-
<p>| With valued others | Bryan &amp; Hershfield, 2012 | Specific | Retirement savings | Prompting new meanings, by providing new information | Could otherwise motivate positive behavior change, an exercise was developed that tied a value-affirmation to quitting. Smokers reflected on a personally important value they shared with a close friend or family member who supported their intention to quit. At a 6-month follow-up, this increased the percentage of smokers who had quit (36%), as compared to both a standard values-affirmation (16%) and a control condition (1%). |
|---------------------|--------------------------|----------|-------------------|-----------------------------------------------|
| Represent a behavior as a means to help others | Grant &amp; Hofmann, 2011 | Specific | Health | Direct labeling, of a situation | Placing signs on hospital soap dispensers to encourage medical professionals to wash their hands to protect their patients’ health, instead of signs that emphasized protecting their own health, increased soap use over a 2-week period. |
|                     | Yeager, Henderson, et al., 2014; see also Paunesku et al., 2015; see | General | Education | Increasing commitment through action: Saying-is-believing | High school students (1) identified a social problem important to them, (2) reviewed stories from other adolescents describing how an awareness of social problems and a desire to contribute positively to the world motivated them to work harder in school, and (3) wrote |</p>
<table>
<thead>
<tr>
<th>Leverage descriptive social norms</th>
<th>Represent what people “like me” do</th>
<th>Bond et al., 2012</th>
<th>Specific</th>
<th>Civic behavior</th>
<th>Prompting new meanings, by providing new information</th>
<th>Incorporating references to friends who have voted on an election day get-out-the-vote message on a social-media website (Facebook) seen by an estimated 61 million people raised turnout in US Congressional elections by an estimated 340,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadmin</td>
<td>Bond et al., 2012</td>
<td>Specific</td>
<td>Civic behavior</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Middle class, Midwestern housewives during World War II either listened to a lecture providing substantive information on the virtues of “ethnic” organ meats and recipes or took part in a small-group discussion that emphasized how “housewives like you” can serve such meats. Facilitating the illusion of group decision making to make this change, the discussion ended with a show of hands to serve organ meats. The small-group discussion increased the percentage of housewives who served organ meats to their families over the next week from 3% to 32%.</td>
<td></td>
</tr>
<tr>
<td>Paluck, 2009</td>
<td>Specific</td>
<td>Intergroup relations</td>
<td>Prompting new meanings, by providing new information</td>
<td>Providing villages in post-genocidal Rwanda access to a radio soap opera that described positive norms of intergroup relationships led villages to be less likely to require that their children marry within their group, to be more willing to speak out in dissent, and to report more empathy for other Rwandans.</td>
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<tr>
<td>Yoshida et al., 2012</td>
<td>Specific</td>
<td>Intergroup relations</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Exposing people to a video depicting a racist joke but withholding the audience’s laughter improved implicit normative evaluations of that group (the association between the group and “most people like”) and reduced discrimination against the group on a laboratory task.</td>
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</tr>
<tr>
<td>Paluck &amp;</td>
<td>Specific</td>
<td>Peer relationships</td>
<td>Prompting new</td>
<td>High school students identified through social</td>
<td></td>
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</tr>
</tbody>
</table>

also Brown et al., 2015

As compared to an active placebo control condition, this raised GPA in math and science classes the next academic term with the greatest effect for initially low-performing students. It also promoted sustained self-regulation on boring but important foundational learning tasks.
<table>
<thead>
<tr>
<th>Attractive or desirable people do</th>
<th>Shepherd, 2012;</th>
<th>Meanings, by altering the situation</th>
<th>Network analyses as social referents (nominated by many peers as high status and as friends) were randomized to an anti-bullying intervention in which they identified roles students can play in harassment, wrote essays and discussed experiences of harassment. They then read their essays at a school assembly, performed a skit illustrating common types of harassment and ways to speak out against it, and created posters of themselves wearing anti-harassment slogans. A week later students who were more socially connected to social referents randomized to the treatment versus a control condition reported seeing conflict as normal less and greater efforts to deescalate conflicts and to stand up for peers subject to harassment. Toward the end of the year they were more likely to be nominated by teachers as defending other students from harassment and received fewer disciplinary citations for harassment-related infractions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paluck et al., 2016</td>
<td>Specific Peer relationships</td>
<td>Prompting new meanings, by altering the situation</td>
<td>Fifty-six middle schools were randomized to an intervention in which 15% of students at each treated school were randomized to receive an anti-conflict norm intervention or not. The intervention comprised every-other-week meetings to encourage students to identify common conflict behaviors, to oppose those behaviors publicly, to create hashtag slogans and online and physical posters including their own photographs, and to distribute distinctive wristbands to students seen mitigating conflict. A total of 728 students received the intervention. This reduced disciplinary problems among the 11,938 students in the treated schools over a year by 30%. The greatest effects were observed in schools in which more of the participating students were influential within the school peer network and thus positioned to alter school norms.</td>
</tr>
<tr>
<td>Represent what people do “here”</td>
<td>Braga &amp; Bond, 2008</td>
<td>Specific</td>
<td>Criminal behavior</td>
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</tr>
<tr>
<td>Goldstein et al., 2008</td>
<td>Specific</td>
<td>Environmental behavior</td>
<td>Direct labeling, of social norms</td>
</tr>
<tr>
<td>Hallsworth et al., 2014</td>
<td>Specific</td>
<td>Civic behavior</td>
<td>Direct labeling, of social norms</td>
</tr>
<tr>
<td>Represent how people are changing (dynamic norms)</td>
<td>Sparkman &amp; Walton, under review Experiment 3</td>
<td>Specific</td>
<td>Environmental behavior</td>
</tr>
<tr>
<td>Sparkman &amp; Walton, under review Experiment 4</td>
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<td>Represent norms as a collective goal</td>
<td>Howe et al., under review</td>
<td>Specific</td>
<td>Environmental behavior</td>
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<td>Represent what another group to be distinguished from does</td>
<td>Berger &amp; Rand, 2008</td>
<td>Specific</td>
<td>Health</td>
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<td>Leverage prescriptive social norms</td>
<td>Allcott, 2011</td>
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<td>Schultz et al., 2007</td>
<td>Specific</td>
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<td>Direct labeling, of social norms</td>
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Supplementary References


Wise Interventions: Supplementary Tables

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