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**Wise Interventions:
Psychological Remedies for Social and Personal Problems**

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Abstract

Long-standing social problems such as poor achievement, personal and intergroup conflict, bad health, and unhappiness can seem like permanent features of the social landscape. We describe an approach to such problems rooted in basic theory and research in social psychology. This approach emphasizes subjective meaning-making—working hypotheses people draw about themselves, other people, and social situations; how deleterious meanings can arise from social and cultural contexts; how interventions to change meanings can help people flourish; and how initial change can become embedded to alter the course of people’s lives. We further describe how this approach relates to and complements other prominent approaches to social reform, which emphasize not subjective meaning-making but objective change in situations or in the habits and skills of individuals. In so doing, we provide a comprehensive theoretical review and organization of a psychologically informed approach to social problems, one that encompasses a wide-range of interventions and applies to diverse problem areas.

Keywords: intervention; education; health; relationships; well-being

Wise Interventions: Psychological Remedies for Social and Personal Problems

I. Introduction

The field of psychology originated with efforts to understand and change human behavior—that is, as both a theoretical and an applied science. Early psychodynamic approaches aimed to understand the causes of personal distress and how these could be mitigated (Breuer & Freud, 1891). Jean Piaget's (1926) pioneering work on child development was motivated in part by a desire to improve schooling. Both Edward Thorndike (1920) and Daniel Kahneman (2011) developed important psychological principles in their work screening soldiers for the military (for the United States and Israel armies, respectively). Social psychology was born out of concern for the social problems of the mid-20th century, particularly problems of intergroup relationships, and attempted both to understand and address these problems (Allport, 1954; Asch, 1952; Clark & Clark, 1947; Festinger, 1957; Lewin, 1951, 1958; Sherif, Harvey, White, Hood, & Sherif, 1961). At the outset, theory and application went hand-in-hand.

But after these rich beginnings, basic and applied research went their separate ways. Nowadays most graduate students are trained to conduct either basic research, primarily in laboratory studies, or applied research. Major journals tend to publish one sort of research or the other (e.g., the *Journal of Experimental Psychology: General* versus the *Journal of Applied Psychology*). There are exceptions, of course, such as research and practice in clinical psychology (e.g., Beck, 2011), but for the most part psychologists consider themselves to be either basic or applied researchers.

This separation is understandable given the increasing specialization in all sciences. We suggest, however, that it has constrained theory development, by divorcing psychological processes from the real world, and limited the kinds of interventions developed to address major

social problems. The main purpose of this paper is to argue for a rapprochement between basic and applied research. Indeed, this rapprochement has been gaining momentum in recent years, and with it a rich new tradition of intervention research that draws directly on and feeds back into basic theory. We document this approach and extract from it key principles. To be clear, we will not present a unified theory of behavior change that can be used by researchers and practitioners in every area. We will, however, present theoretical principles, based largely on basic research in social psychology, that can guide research and intervention in many settings.

To illustrate this approach, consider three problems:

- A middle-school teacher finds that her students respond poorly to critical feedback. Even though she wants to help them improve, they disengage. How can she help students learn from feedback?
- A social worker finds that a new mother, abused herself as a child, is increasingly angered by challenges with her baby. 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 despite strong academic credentials. How can she help them succeed?

On their face, these problems may seem to have little in common. We suggest, however, that they have similar psychological roots, namely that the key actor in each—a middle-school student, a mother, and a college student—has developed maladaptive views of themselves and/or their circumstances. Understanding the nature of these views, how they arise, and how they can be changed, can change people's behavior and improve outcomes.

How can the teacher help her students learn from feedback? One study targeted how middle-school students understood teachers' motives in providing feedback. Researchers clipped a note from teachers to feedback the teachers had provided on students' essays. The note

conveyed that teachers gave the feedback to help the student reach a higher standard, which she believed the student could achieve (termed “high standards and assurance”). Compared to a randomly assigned control condition with a nice but irrelevant note, this note 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. The feedback did not change but students’ *interpretation* of the teacher’s intention in giving it did (Yeager, Purdie-Vaughns et al., 2014).

How can we help mothers at risk for child abuse? One of the most effective approaches targets mothers’ view of why their babies are fussing and how they can address that behavior. Researchers trained paraprofessionals to ask at-risk mothers questions during home visits that encouraged the mothers to see problems in parenting as normal and solvable, not as meaning that they were “a bad mom” or that their child was “a bad baby.” Compared to a randomly assigned control group of mothers who received visits without these questions, the intervention reduced the rate of abuse in the child’s first year from 23% to 4% (Bugental et al., 2002).

How can a college administrator increase the likelihood that minority students succeed? One study targeted students’ views of adjustment difficulties in the first year. Using stories from older students, researchers conveyed, in a one-hour session, that it is normal to worry at first about whether you belong in college and that this concern passes with time. Compared to a randomly assigned control group that completed a neutral exercise, this message raised African American students’ grades over the next 3 years, halving the racial achievement gap (Walton & Cohen, 2011).

These studies underscore (1) that how people make sense of themselves and social situations plays a critical role in the unfolding of their behavior; (2) that key meanings can be

altered in precise ways, often with brief exercises; and (3) that doing so can lead to lasting personal and social change.

This approach has been given different names, such as “story editing” (Wilson, 2011) and “wise interventions” (Walton, 2014). We adopt the latter term here, though in so doing we want to be very clear about what this term does and does not mean. The word “wise” is borrowed from Erving Goffman (1963), who used the word 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 define “wise interventions” as ones that focus on (are “wise to”) the meanings and inferences people draw about themselves, other people, or a situation they are in and use precise, theory- and research-based techniques to alter these meanings. They are “psychologically wise”; even where we use the term “wise” alone, we mean it in this sense. By “wise” we do not mean “good” or “superior” or that other approaches are “bad” or “unwise.” Far from it. We have enormous respect for all research that has succeeded in changing people’s behavior in positive ways and have adopted lessons from many applied studies in the approach we advocate here.

Roadmap

We begin by describing the theoretical foundations of psychologically wise interventions and how these derive from basic research, especially the centrality of meaning making for people’s behavior. We go beyond reviews that have focused on a single intervention (e.g., self-affirmation, Cohen & Sherman, 2014) or content area (e.g., education; Garcia & Cohen, 2013; Harackiewicz & Priniski, 2017; Stephens, Markus, & Fryberg, 2012; Yeager & Walton, 2011) to address a wide range of interventions and social problems; however, we often illustrate key

points in school contexts because many interventions have been tested there. Second, we discuss five principles that characterize interventions to change meanings. Third, we describe three basic motives that guide meaning-making and have been central to psychologically wise interventions—the need to understand, the need for self-integrity, and the need to belong—and specific techniques that capitalize on these motivations to change meanings. We then organize interventions into three “families” according to these motives and elaborate this organization with diverse examples. Fourth, to illustrate the distinctive qualities of wise interventions, we compare them with two common approaches to social reform, which focus on changing the objective qualities of situations or of people. We close with a discussion of how much more there is to be learned at the intersection of subjective meaning-making and social contexts and highlight implications and high-priority directions for research, including ways to scale wise interventions to address societal problems at large.

II. Theoretical Foundations of Psychologically Wise Interventions

Many social reforms aim to remedy a lack of capacity in either the person (e.g., enhancing skills or habits) or the situation (e.g., improving resources, opportunities, or incentives, altering “nudges”; Dittmann & Stephens, 2017; Stephens et al, 2012). Although this is often important, psychologically wise interventions do not address the objective qualities of either people or situations. Instead, they assume that subjective meaning-making—how people make sense of themselves and social situations—can prevent people from taking advantage of opportunities for improvement already available to them (Coleman et al., 1966; Walton & Spencer, 2009). And they seek to change these meanings.

The Ambiguity of the Social World and People’s Working Hypotheses

Virtually every situation is open to interpretation—Why is the baby fussing? Is it her

fault, my fault, or due to something benign?—and it is the interpretation people draw that guides behavior (Asch, 1952; Heider, 1944; Jones & Davis, 1965; Kelley, 1973; Lewin, 1958; Ross & Nisbett, 1991). A variety of terms have been used to describe these interpretations, including *subjective construal* (Ross & Nisbett, 1991), *mindsets* (Dweck, 2006), *causal attributions* (Kelley, 1967; Weiner, 1985), and *stories* (Wilson, 2011). To avoid awkward terminology, we use colloquial synonyms like “meaning making” and “interpretation.” Regardless of the term, the foundational principle is that, to predict behavior, it is essential to understand how people make sense of their actions and circumstances, as in how a mother understands a fussing baby.

Certainly, some situations are more open to interpretation than others; some situations are so powerful that most people understand them the same way. Some of social psychology’s most famous studies emphasize the power of these situations. Latané and Darley (1970) showed that the greater the number of people who witnessed an emergency, the less likely any one person would help. But even in these studies it was not the power of the objective situation per se that determined behavior but how people understood the situation as it developed. The larger the group, the more likely people assumed that someone else would intervene, or that no help was needed.

Just as there is latitude in how people understand social situations, so there is latitude in how people understand themselves. For example, many people are exposed to the idea that intelligence is essentially fixed at birth. This belief can lead them to interpret academic struggles as evidence that they lack ability or have reached the edge of their abilities, undermining subsequent effort, learning, and achievement (Dweck, 1999). 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 increase their intelligence (a person-centric approach). It changes the meaning academic struggle has to a student, which can sustain motivation and improve performance over an academic term or longer among adolescents (Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003; Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015) and college students (Aronson, Fried, & Good, 2002; Yeager, Walton, et al., 2016).

The idea that people's behavior stems from interpretations of themselves and their social environment is not new. Virtually all psychological theories other than radical behaviorism stress internal psychological processes as mediators of behavior. What is more novel is the idea that people's interpretations are not fixed but, often, are relatively amenable to change. Some personal narratives, to be sure, are not easily revised. But there is accumulating evidence that people's interpretations often function more like *working hypotheses* that can be altered with brief but targeted exercises. This is particularly true, we will argue, at transition points when people's narratives about themselves and their circumstances are developing, such as when students enter a new school (Cook et al., 2012; Raudenbush, 1984; Goyer, Cohen, et al., 2018; Walton & Cohen, 2011; Wilson & Linville, 1982, 1985).

Also novel is the idea that, even as interpretations are pliable at key times, views can become fixed, like clay, in the structure of people's lives, for better or for worse. Thus, a change in meaning can endure. It is this combination of ideas that is so striking in the examples presented above. People's interpretations of their circumstances had negative consequences (e.g., "Maybe I don't belong in college"), these interpretations were working hypotheses that could be changed with brief exercises (a one-hour session), and people's new, more adaptive interpretations ("Maybe I can come to belong") drove behaviors that ultimately confirmed the

new hypothesis, improving people's lives for years to come. A major goal of this article is to discuss when, how, and why this is possible.

III. General Principles of Psychologically Wise Interventions and Their Implications

Wise interventions are characterized by five principles.

1. Alter Specific Meanings to Promote Change

Wise interventions alter specific ways people make sense of themselves or social situations. They are not general exhortations like, "Think positive!" They address specific psychological questions. In school, students who face negative stereotypes and underrepresentation can risk wondering whether "people like me" can belong. To address this, the social-belonging intervention discussed earlier did not simply assert that students belong or pass out school t-shirts. Rather, it provided a narrative to help new students understand social adversities in nonthreatening ways—as normal early in college for all students and as improving with time, not as evidence that "people like me" do not belong (Walton & Cohen, 2011).

In close relationships, too, people can draw pejorative inferences. People with low self-esteem can doubt their own value and thus readily dismiss compliments from partners as "just something she had to say" (Murray, Holmes & Collins, 2006). Addressing this problem, Marigold, Holmes, and Ross (2007, 2010) asked people to recall a recent compliment from their partner. To encourage people to see the compliment as truly reflecting the partner's love, they then asked: "Explain why your partner admired you. Describe what it meant to you and its significance for your relationship." As compared to simply recalling the compliment, this query led people with low self-esteem to feel more confident in their partner's love and, over the next several weeks, instigated a cycle of more positive feelings and behaviors in both members of the couple, improving the relationship as a whole.

The specificity of wise interventions has important advantages for theory and application. First, it enables researchers to identify the causal effect of a specific meaning-making process within a complex system. The social-belonging intervention, for example, teaches us that concerns about belonging contribute to inequality in college achievement and shows how this process plays out. Second, just as understanding the specific cause of a disease (e.g., unsafe water and cholera) can lead to efficient remedies (improved sanitation), so too can understanding a specific maladaptive meaning-making process suggest efficient reforms. And third, in targeting a specific process, psychologically wise interventions can provide a theoretical account of what will work with whom and when. As we will discuss, meanings arise from contexts and people's perspective on these contexts. Wise interventions will be effective only in contexts in which the relevant meanings are at play (see Row A in Table 1). People with high self-esteem, for instance, generally need no help taking a compliment, whereas people with low self-esteem may.

Indeed, all the examples mentioned at the outset of this paper are moderated in predictable ways. African American students whose trust in teachers was most tenuous benefitted most from notes conveying high standards and assurance (Yeager, Purdie-Vaughns et al., 2014). Preventing the inference "My child is a bad baby" reduced abuse most for mothers with more challenging infants (born preterm or with low Apgar scores; Bugental et al., 2002). Representing challenges to belonging as normal and temporary benefits students who face social disadvantage in a school context most (Walton & Cohen, 2011; Walton, Logel, Peach, Spencer, & Zanna, 2015; Yeager, Walton, et al., 2016). Understanding in what contexts and for whom specific deleterious meanings arise and may be mitigated is a fundamental question for research.

2. Meanings Operate Within Complex Systems

Subjective meanings do not work in a vacuum but within complex systems. They will

improve outcomes only when other aspects of the system necessary for improvement are in place. Thus, removing a psychological obstacle to learning in a setting that does not offer learning opportunities will not help (see Row B in Table 1; Lewin, 1958; Walton, 2014; Yeager & Walton, 2011; e.g., Dee, 2015). The inverse is also true: If psychological obstacles go unremedied, improving learning opportunities will not be fully effective. In one laboratory study, improving the quality of instruction raised student achievement but only if students were first led to view their struggles as challenges that could be overcome (Menec et al., 1994). In a field study, providing struggling elementary school students high-quality learning materials raised math scores, but the improvement doubled when accompanied by an approach designed to increase students' self-efficacy (Bandura & Schunk, 1981). Thus, in addition to theory about meaning making, wise interventions involve theory about how meanings contribute to outcomes among other forces in the system. Practically, wise interventions can go hand-in-hand with structural reforms.

Table 1. Situational and personal factors necessary for psychologically wise interventions to be effective at all (Rows A and B) or in ways that last (Row C).

Sources of Heterogeneity in Intervention Effects
A. A specific deleterious meaning undermines functioning for a given group of people in a given situation but can be remedied; or a specific positive meaning is available but not fully realized.
B. Capacity necessary to support better outcomes is present in both the situation (e.g., in school, quality learning opportunities) and people (e.g., students' preparation and skills to learn).
C. The situation affords opportunities for a change in meaning to become embedded in the structure of people's lives in ways that propel benefits forward in time (e.g., in school, better relationships that support greater success, higher tracks that support greater growth). Absent such affordances, an intervention may be helpful in the short-term but not yield lasting benefits.

3. New Meanings Can Stimulate Recursive Change in People and in Situations

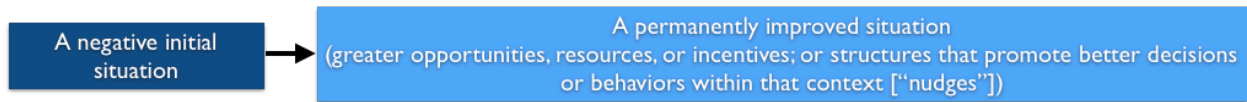
Changes in meanings can be self-sustaining. When meanings are detrimental—such as pejorative interpretations of critical feedback (e.g., as biased or disrespectful), of the self (e.g., fixed theories of intelligence, low self-esteem), or of social relationships (e.g., worries about belonging, doubts about a partner’s love)—people can think and act in ways that become self-fulfilling. People can even be motivated to maintain negative views of themselves, if they see these views as true (Swann, 2012). Many wise interventions aim to redirect people into more positive ways of understanding themselves and their circumstances so as to improve trajectories. Indeed, one of the most novel and important aspects of wise interventions is that positive change in people’s working hypotheses can itself become self-fulfilling and embedded in the structure of their lives. Thus, recursive cycles can go from self-defeating to self-enhancing, propelling gains forward in time or even making them “snowball” (Cohen & Sherman, 2014; Kenthirarajah & Walton, 2015; Okonofua, Walton, & Eberhardt, 2016; Newcomb, Koenig, Flacks, & Warwick, 1967; Rosenthal & Jacobson, 1968; Storms & McCaul, 1976; Valins & Nisbett, 1971; 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 in a permanent way or their skills or “character.” Nor is it restricted to a given situation, which, once people exit, may lose its influence. Instead, change is represented as an ongoing, mutually reinforcing transaction between the person and the social environment, as illustrated in Figure 1.

Evidence for recursive change. Given the importance of recursive processes, here we review evidence for the model depicted in Figure 1C using several examples, beginning with Walton and Cohen’s (2011) social-belonging intervention. As noted, African American students who received the one-hour treatment in the first year of college earned higher grades over the

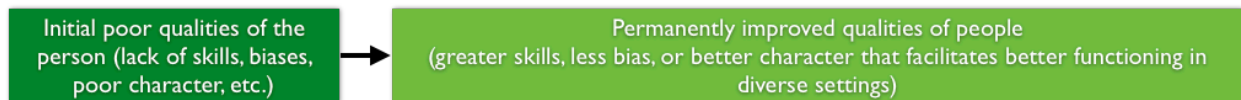
next three years. How did this happen?

Figure 1. Mechanisms of lasting change in three basic approaches to social reform.

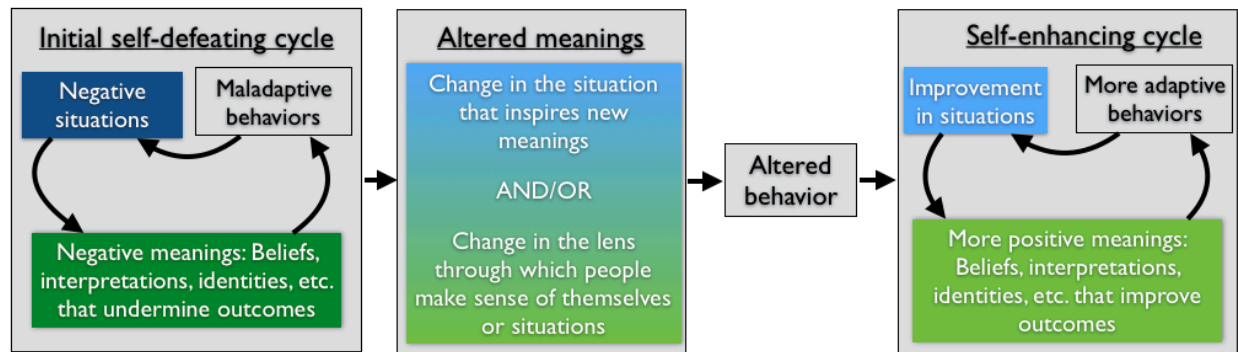
A. Situation-Centric: Fixed Change in Situations



B. Person-Centric: Fixed Change in Persons



C. Wise Interventions: Recursive Change in Persons and Situations



The intervention aimed to alter students’ lens for interpreting their stream of daily experience in college, such that common negative experiences (like criticism and feelings of loneliness) would not appear to be global threats to their belonging (bottom portion of the middle panel in Figure 1C). Indeed, daily-diary data showed that, in the week after the intervention’s delivery, African American students in the intervention condition no longer reported feelings of nonbelonging on days they faced greater adversity (Walton & Cohen, 2007, 2011). This change in meaning-making was accompanied by greater engagement in school (“altered behavior” in Figure 1C), such as studying more and emailing professors more (Walton & Cohen, 2007). Consistent with the hypothesized self-enhancing cycle, the change in meaning (as assessed by daily diaries) statistically mediated the 3-year improvement in grades through senior year. At the

end of college, African American students also showed evidence of sustained psychological change, namely greater confidence (less uncertainty) in their belonging in college in the intervention condition (Walton & Cohen, 2011).

The recursive process did not stop at graduation. Three to five years later (7-9 years after treatment), African Americans who had received the intervention reported greater life and career satisfaction (Brady et al., in prep B). These gains were mediated by participants' reports of having developed more significant mentor relationships in college and relationships that extended after college. In short, the intervention altered how students made sense of social challenges at a critical time, the transition to college. This empowered them to build positive relationships, creating a self-enhancing cycle that undergirded greater success as adults. For a conceptual model of these processes, see Yeager, Walton and colleagues (2016, Figure 1).

Other samples confirm that the social-belonging intervention can help students enter better situations, especially relationships that reinforce a sense of belonging. In another sample, the intervention increased friendships with male peers among women in male-dominated engineering majors (Walton et al., 2015); in a third, it increased close friendships on campus, involvement in student groups, and the likelihood of having developed a mentor on campus at the end of the first year among students from socially disadvantaged backgrounds (Yeager, Walton, et al., 2016). In both samples, the treatment also raised first-year grades. Each case suggests that the intervention improved recursive processes that unfolded over time.

Similar processes can play out at younger ages. One social-belonging intervention adapted for middle school—delivered in two 30-minute class sessions at the start of 6th grade—reduced disciplinary citations among African American boys from 6th grade through 12th grade by 65%, nearly closing the disparity with White boys (Goyer, Cohen et al., 2018). It did so,

analyses suggest, by improving cycles of interactions with classroom teachers. The intervention, delivered to students with teachers blind to condition, altered students' behavior in such a way that prevented a rise in the number of discipline citations African American boys received within 6th and 7th grades that specifically involved the subjective judgment of teachers. By the end of 7th grade, it had prevented the emergence of negative global beliefs in students about being seen stereotypically and not belonging in school. Once established, the pattern of reduced discipline problems continued through the end of high school (for a related example, see Yeager, Purdie-Vaughns, Hooper, & Cohen, 2017).

Other interventions also show how psychological change can help people enter better situations, empowering success. Value-affirmation interventions, which we will review later, can cut off cycles of threat and poor performance among ethnic-minority students, improving their academic trajectory (Cohen et al., 2009). One delivered in 7th grade increased the likelihood minority students entered a college readiness track 2 years later, a potent change-in-situation. In another sample, African American students who had received an affirmation in 7th grade were more likely to enroll in a 4-year college on-time after high school (92% vs. 78%; Goyer, Garcia et al., 2017).

Recursive processes can also be shifted in contexts beyond education. Marigold and colleagues' (2007, 2010) intervention to help people with low self-esteem feel more confident in their partners' love led them to behave less negatively toward their partners over the next few weeks, as reported by partners (who were blind to condition). This in turn was reciprocated in more positive behavior by partners (as reported by participants), improving the situation for the original participants and sustaining better relationships. Bugental and colleagues' (2002) intervention to prevent new mothers from inferring they were "a bad mom" not only reduced

abuse over the child's first year. By the child's third birthday, it reduced children's stress and aggression and improved their health and cognitive functioning, easing parenting (Bugental, Beaulieu, & Silbert-Geiger, 2010; Bugental, Corpuz, & Schwartz, 2012; Bugental & Schwartz, 2009; Bugental, Schwartz, & Lynch, 2010). An exercise that led students to feel hypocritical about their intergroup attitudes not only led students to value equality more highly 3 weeks later but increased the percentage of students who chose to major in an ethnic studies core 5 months later—a change-in-situation that could sustain more positive intergroup attitudes, which were observed as long as 15-17 months later (Rokeach, 1971).

In sum, there is strong evidence that brief interventions that target how people make sense of themselves or a social situation can lead to long-term gains by altering people's behavior and the situations they enter, which then reinforce more adaptive meanings and support better trajectories. Nonetheless, there is much to be learned about exactly how recursive processes play out, a topic we return to later.

Implications. If lasting change arises from the interplay between persons and situations, then the long-term effects of wise interventions will depend not just on the meanings targeted by the intervention but on the *affordances* of the situation (Gibson, 1977): Does the situation allow an initial change in meaning and behavior to become embedded in people's lives in ways that could cause lasting improvement? Will a romantic partner respond favorably to a positive overture? Can racial-minority students form strong relationships on campus? If not, lasting change may be unlikely (see Table 1, Row C).

Long-term effects can also depend on whether a new meaning is delivered in a way that people can integrate in their lives. Externally imposed, time-bound interventions risk leaving the change in meaning tied to the intervention. In a tragic case, Schulz (1976) aimed to bolster a

sense of control among retirement-home residents by allowing them 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 were healthier and happier at the end of this period (e.g., rated as having more “zest for life”). 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 than residents in the comparison conditions (Schulz & Hanusa, 1978). The intervention targeted an important self-perception—a sense of control—but changed it in a time-bound way limited to the study. Providing and then removing this sense of control was worse than not providing it at all (cf. Langer & Rodin, 1976; Rodin & Langer, 1977).

4. Methodological Rigor and Process

As the previous example suggests, as with any attempt to change behavior in applied settings, wise interventions should be tested rigorously, with randomized field experiments. Development typically starts small, often in laboratory research, with the goal to clarify key meanings, their nature, consequences, and malleability—that is, to deepen psychological wisdom. Such research may be inspired by qualitative work, theory or past laboratory experiments, or insight into a problem in the world. It then moves to small-scale field experiments that aim to develop effective strategies for intervening and to understand how altered meanings play out in context and over time. Usually this 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 effects. Once an intervention is shown to be effective in small-scale field trials, researchers may develop forms that can be delivered to large numbers of people, contributing to social policy. For example, the Walton and Cohen (2011) social-belonging intervention and related exercises have

been transformed into online modules that can be delivered to full cohorts of college students. In three samples, this raised first-year persistence and achievement for socially disadvantaged students ($N > 9,500$), reducing institutional achievement gaps by 31-40% (Yeager, Walton, et al., 2016). At this stage, a critical question involves social contexts—where and with whom is the intervention more and less effective, why, and what adaptations are necessary for new settings.

Starting small with rigorous experimental designs contrasts with how many social reforms are implemented, namely widely and without rigorous testing. Sadly, when such programs are later tested, many turn out to be ineffective or even harmful (e.g., Scared Straight programs to reduce teenage violence; the D.A.R.E. anti-drug program; infant simulator programs to reduce teenage pregnancy by giving teens a make-believe infant to care for; Brinkman et al., 2016; Lilienfeld, 2007; Wilson, 2005, 2011). Instead, the systematic development and evaluation of wise interventions parallels, in some respects, the development of medical interventions, with innovation and theory development taking place at each step.

5. Ethical Considerations

Because psychological interventions can go awry, it is vital for ethical as well as scientific reasons to test interventions at each step. Taking a formal, scientific approach also has the advantage of making the changes prioritized by a reform explicit. Although often these changes are endorsed by all (e.g., better health), some cases raise competing values. For example, broken-windows policing aims to instill norms of order by cleaning up signs of disorder and strictly enforcing quality of life crimes (Wilson & Kelling, 1982). This may reduce crime (Braga & Bond, 2008) but increase the harassment of racial minorities (Department of Justice, 2016; Ridgeway, 2007). Bringing such tradeoffs to light can promote a more informed debate, such as how to achieve benefits without incurring costs.

Sometimes the very idea of trying to change how people think and behave raises concerns. Yet this is a ubiquitous—in fact, inevitable—feature of social life, from personal communications to marketing to policy. People constantly try new ways to motivate children or to change adults' behavior (e.g., encouraging smokers to quit). 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 thus not this effort but that they are often based on lay theories or “common sense.” Common sense is not always wrong but too often it leads to approaches that are ineffective or do more harm than good (Wilson, 2011). In medicine, most people recognize the limits of their knowledge and heed the advice of doctors. But when it comes to “treating” social problems lay people and policymakers alike often rely on home remedies. Wise interventions, by contrast, test specific theory-based exercises in rigorous experimental designs in their quest to help people flourish. Upon evaluation, institutions and society at large can choose to implement those interventions at scale that align with commonly agreed-upon goals and have adequate evidence.

Another concern is whether wise interventions fault individuals for having unproductive ways of thinking, “blaming the victim” and reducing social problems to personal failures (Ikizer & Blanton, 2016). However, as we will see, negative meanings are generally not a person's fault but arise from social contexts as reasonable inferences from a perspective. Wise interventions help people reinterpret themselves and their circumstances in ways that are often difficult to do on one's own so as to bring about change in people's lives consistent with their goals.

Comparison with Psychotherapy

Wise interventions have similar goals to some forms of psychotherapy, particularly cognitive behavioral therapy (CBT); thus, it is useful to compare them. Both approaches focus on

how people make sense of themselves and situations as the most direct cause of behavior and aim to revise negative thinking patterns. Yet even as each approach is rich and diverse, wise interventions have somewhat different origins, emphasize different techniques, and apply to a broader range of social problems. Wise interventions grew out of basic research in social psychology on people's beliefs and how to change them, such as attribution theory, dissonance theory, and self-affirmation theory. CBT, while drawing on some of these same areas, was primarily a reaction to other forms of psychotherapy, such as behaviorist approaches and psychoanalysis (Beck, 2011). These different theoretical origins are reflected in different techniques used to cause change. CBT is typically administered in repeated one-on-one sessions in which a psychotherapist helps a client revise persistent negative thinking patterns; here, people understand themselves as having a problem and aim to address this problem intentionally with a professional. In contrast, wise interventions use a wide range of techniques (e.g., signs, cleaning up city streets) and exercises (e.g., value-affirmation reflections, learning how intelligence can grow) to change people's interpretations, many of which can be delivered briefly to many people at once. Recipients need not see themselves as having a particular problem; they are not typically seeking "treatment," in part because the problems addressed are seen as common challenges of social life not as cases of abnormality. As a result, wise interventions address a wide range of problems beyond clinical disorders, such as academic achievement, parenting, prejudice, and health behaviors. Although these areas have developed largely separately, some approaches draw on both traditions (e.g., Pennebaker, 1997). Given their common goals, each would benefit from more direct cross-fertilization.

IV. Motivations Underlying Meaning Making and Techniques for Change

To intervene effectively on the meanings that shape people's behavior, we must

understand the motives that guide how people make sense of themselves and social situations. Psychologically wise interventions aim to capitalize on these motives to redirect meanings in effective ways.

Three Basic Motivations Underlying Meaning Making

The characterization of basic motives is a matter of much discussion (e.g., Baumeister & Leary, 1995; Deci & Ryan, 2000; Dweck, 2017; Fiske, 2010; Heine, Lehman, Markus, & Kitayama, 1999; Pyszczynski & Greenberg, 1987; Swann, 2012; Steele, 1988; Weiner, 1985). It is not our goal to address this debate or to make an exhaustive list of human needs. Instead, we focus on three motives that shape how people make sense of themselves, other people, and social situations—the needs to understand, to think well of oneself, and to belong. Importantly for our purposes, each has led to distinct types of interventions.

1. Need to understand. First, people strive to develop reasonable understandings of themselves, other people, and the world around them, so as to understand and predict their own and other people's behavior and to guide their behavior effectively (Heider, 1958). Initially researchers focused on how people make causal attributions about behavior, as documented in decades of research on attribution theory (Bem, 1972; Heider, 1944, 1958; Jones & Davis, 1965; Kelley, 1967; Weiner, 1985). Subsequent research has examined how people make sense of themselves (e.g., their identity) and the social world (e.g., their relationships) more generally (e.g., Miller, Brickman, & Bolen, 1975; Murray et al., 2006), and broadened the view of the kinds of information people use to draw these inferences, including features of the cultural context (Markus & Kitayama, 2010; Stephens et al., 2012). All approaches in this group, however, share the assumption that people often act like rational information processors—lay scientists trying to make sense of themselves and others as best they can. They also agree that

there is often no single “truth” to be discovered, such as about one’s self-identity, ability in school, or how a romantic partner “really” feels. Instead, people do their best to draw inferences that are consistent with their experiences and the information available to them.

Sometimes the available information leads people to draw pejorative inferences. A 9th grader might reasonably infer, from the existence of “Gifted and Talented” programs, a corporate focus on “talent” (Murphy & Dweck, 2010), and praise like “You’re so smart!” (Gunderson et al., 2013; Haimovitz & Dweck, 2016; Mueller & Dweck, 1998), that intelligence is a fixed quality that cannot change. She might then conclude that a poor score on a first algebra test means she is “not good at math.” Cultural stereotypes also create specific risks or contingencies, and, thus, different perspectives for making sense of the same event (Steele, 1997). In many academic contexts, awareness of the possibility of race-based disrespect can lead Black students, as compared to White students, to consider very different causes of critical academic feedback, even when both are trying to form reasonable impressions of the world (Cohen, Steele, & Ross, 1999). In turn, pejorative inferences can lead to self-defeating cycles of behavior, such as failing to try hard in school (Blackwell et al., 2007; Valins & Nisbett, 1971; Wilson & Linville, 1982).

As these examples imply, meanings, including negative ones about both the self and social events, are not just “in the head” but typically are reasonable responses to the world as it presents itself to a person. A broadly important intervention strategy, then, is give people a new basis for drawing a more adaptive inference, interrupting the flow of ideas that become self-defeating from socio-cultural contexts into minds. There can be multiple potential points of entry to do so, such as by changing how a specific experience is presented to people (e.g., framing feedback from teachers in adaptive ways, Yeager, Purdie-Vaughns et al., 2014, Experiments 1 and 2), or by encouraging a new view of a class of experiences (e.g., teaching students to

interpret feedback in general in adaptive ways, Yeager, Purdie-Vaughns et al., 2014, Experiment 3). One approach alters how the world presents itself to a person; the other alters people's lens for making sense of an aspect of the world (see Figure 1C, middle panel).

2. Self-integrity. While people want their interpretations to be reasonably based in reality, they are not disinterested observers of the world. They also desire or are threatened by certain meanings. The second basic motive underlying meaning making is that people want to think well of themselves—to believe they are adequate, moral, competent, and coherent (Aronson, 1968; Sherman & Cohen, 2006; Steele, 1988). When this sense of “self-integrity” is threatened, people can be defensive and function poorly. This insight has led researchers to develop novel ways to help people maintain a sense of personal adequacy, which can improve functioning in the face of threat (e.g., Cohen et al., 2009). It has also led to ways to motivate positive behaviors by casting them as ways to restore or bolster a sense of adequacy (e.g., Stone, Aronson, Crain, Winslow, & Fried, 1994).

3. Belonging. The third basic motive arises from the fact that we are an inherently social species. People want to feel connected to others: to be accepted and included, to be valued members of social groups, and to contribute positively to the lives of others. Indeed, forming and maintaining social relationships is among our most important tasks from birth (Asch, 1952; Baumeister & Leary, 1995; Bowlby, 1988; Deci & Ryan, 2000; Dweck, 2017). When this need to belong is threatened, people can experience distress and dysfunction; some interventions bolster a sense of belonging and connection to improve functioning (e.g., Motto & Bostrom, 2001). Others leverage the need to belong to motivate positive behaviors, such as by casting a specific desired behavior as a way to strengthen a person's relationships, social standing, or fit within a social community (e.g., Goldstein, Cialdini, & Griskevicius, 2008).

We reiterate that these motives are not an exhaustive list of human goals; nor do they operate independently. For example, people often seek interpretations that cast them in a positive light (need for self-integrity) within the bounds of plausibility (a reasonable understanding; Pyszczynski & Greenberg, 1987). Yet they are worth considering separately because they represent different traditions of research in social psychology that have led to unique insights about why people form interpretations and how to change them. Indeed, each has led to 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). One purpose of this article is to highlight how decades of theoretical work in social psychology—in attribution theory, theories of self-integrity (e.g., dissonance and self-affirmation theories), and theories of social belonging (e.g., social norms)—is blossoming into a theoretically-driven approach to address a wide array of personal and social problems, even though this research may have seemed to have little applied relevance at the time.

Techniques to Change Meaning Making

How do psychologically wise interventions capitalize on the three motivations to encourage more adaptive meanings? Unlike learning a new skill (like calculus or golf), changing the meaning people ascribe to themselves or a social experience does not generally involve practice or repetition; more is not necessarily better. It does not take 10,000 hours to learn the idea that intelligence can grow with effort, good strategies, and help. However, people can ignore or resist new ideas, or fail to connect them to their personal lives. Wise interventions thus use strategies honed in basic research to offer people constructive meanings in compelling ways.

Typically, wise interventions are minimally directive; less can be more. They offer

people new information, place people in new situations, or structure 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 allow people to internalize or “own” the relevant change. Efforts to change people’s beliefs that seem controlling, stigmatizing, or irrelevant are unlikely to be taken to heart (Brehm, 1966; Deci & Ryan, 2000; e.g., Silverman, Logel, & Cohen, 2013).

There are four broad types of change strategies:

1. Direct labeling. A classic study found that twice as many people cooperated when a prisoner’s dilemma activity was called “the Community Game” rather than “the Wall Street Game” (Lieberman, Samuels, & Ross, 2004). A direct approach 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*: e.g., Miller, 1975; *labeling of others*: e.g., Rosenthal & Jacobson, 1968; *situation-labeling*: e.g., Goldstein et al., 2008). Directly labeling the self, however, can be more effective with children than with adolescents or adults, who may have more established self-views and may react against messages that appear coercive (Yeager, Dahl, & Dweck, 2017). Direct labels can also 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 interventions give people a basis for drawing a new inference but do not impose the inference itself. This 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). For example, cleaning up a neighborhood implies that rule-breaking is inappropriate—a meaning-relevant change in situation—and can reduce crime

(Braga & Bond, 2008). Other studies provide new facts, such as about the malleability of intelligence, altering how students make sense of their own struggles in school (Blackwell et al., 2007). Third, as any good lawyer knows, well-targeted questions can introduce new ways of thinking (Loftus & Palmer, 1974). Leading questions *assume* an idea and encourage people to elaborate on its significance, such as to understand how a compliment has a global meaning (Marigold et al., 2007). Moreover, as compared to direct appeals or the provision of overtly relevant information, questions may seem less controlling.

3. Increasing commitment through action. As research on cognitive dissonance shows, people are motivated to see their behaviors and attitudes as consistent (Aronson, 1968; Festinger, 1957). Thus, creating situations that inspire people to freely act in line with a new idea can cement psychological change. An especially powerful technique is *saying-is-believing* (Aronson, 1999; Higgins & Rholes, 1978). People are provided new information in a way that implies the idea is intuitive and one they already endorse. They are then asked to explain the idea to other people, often in the form of advice to younger or less experienced people than themselves, using examples from their own experience. Compared to simply providing information, this (1) encourages people to think about an idea actively rather than to just receive it passively, promoting learning; (2) treats people as helping others, leveraging prosocial motivations (Yeager, Henderson, et al., 2014), rather than as recipients of an intervention, a potentially stigmatizing role (Alvarez & van Leeuwen, 2015; see Yeager, Romero, et al., 2016), or of a persuasive appeal, which could be rejected; (3) encourages people to advocate for an idea, increasing its persuasive appeal (Festinger & Carlsmith, 1959); and (4) helps people connect the idea to their own lives and thus personalize and take ownership of it, allowing standardized materials to speak to diverse people. Saying-is-believing procedures have contributed to some of

the largest gains in the literature (Aronson et al., 2002; Okonofua, Paunesku, & Walton, 2016; Paunesku et al., 2015; Walton & Cohen, 2011; Wilson & Linville, 1985; Yeager, Henderson, et al., 2014; Yeager, Johnson, et al., 2014; Yeager, Purdie-Vaughns et al., 2014, Experiment 3). Later, we will also discuss other commitment techniques based in dissonance theory.

4. Active reflection exercises. A variety of exercises help people reframe their experiences, often through writing. People do not receive new information and are not asked to change their behavior in any way. Instead, they write in open-ended ways in response to structured prompts that help them reinterpret events on their own. Some exercises focus on positive qualities, such as positive ways to think about the self, connections with others, or ways to complete goals, so as to help people cultivate these qualities (e.g., Chen, Chavez, Ong, & Gunderson, 2017; Sheldon & Lyubomirsky, 2006). Others focus on negative experiences, which can give rise to unproductive cycles of negative thoughts and feelings, and aim to help people think more clearly and find resolution or positive meaning in them to improve functioning (e.g., Pennebaker, 1997). A third group, value-affirmation exercises, aims to mitigate psychological threat by reconnecting people with core personal values (Cohen et al., 2009).

V. Three Families of Psychologically Wise Interventions

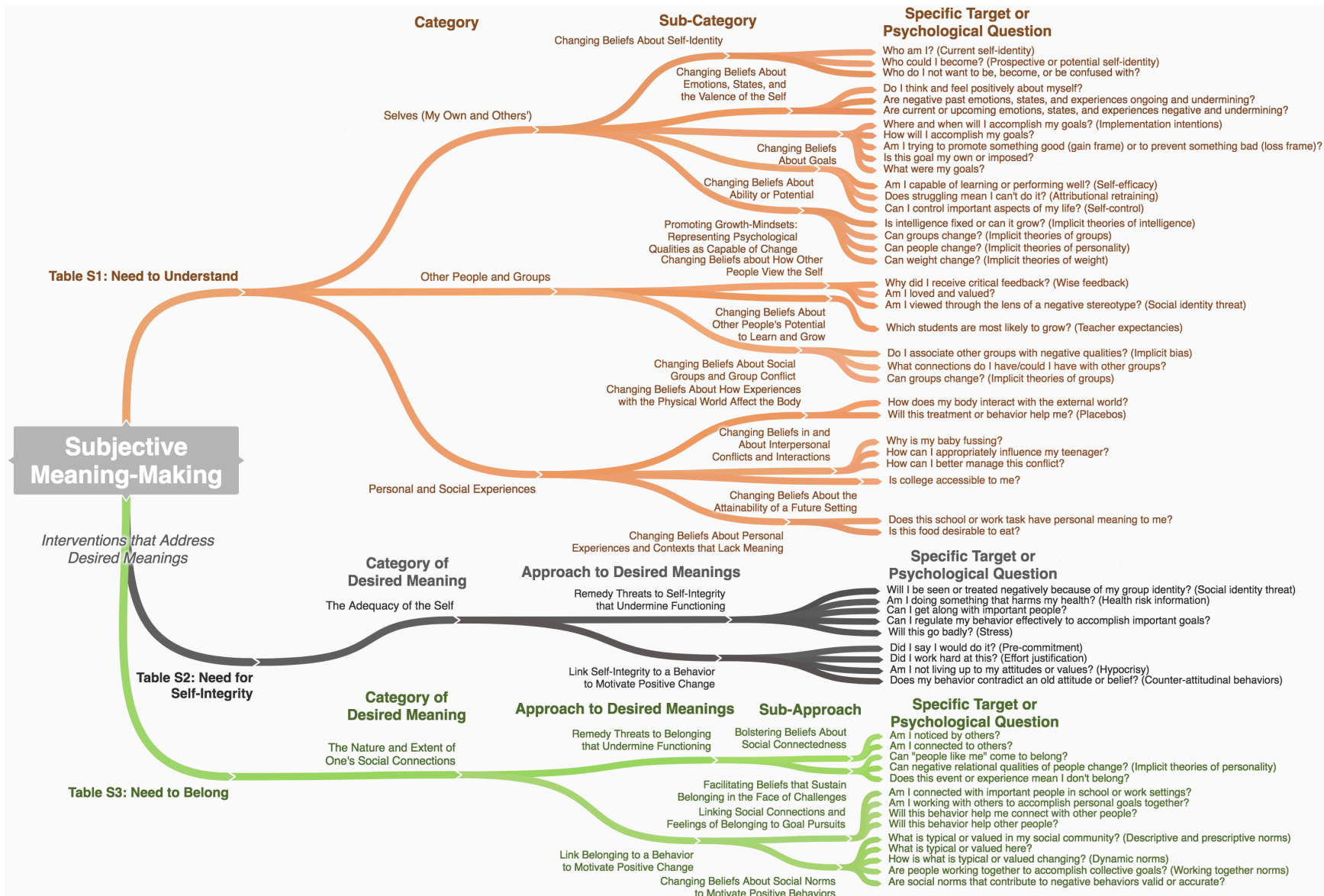
Here we organize wise interventions into three families corresponding to the motives of meaning making discussed above. Many interventions capitalize squarely on one motivation or another, although others draw on multiple ones. Nonetheless, the families provide a useful organization, and inform how interventions relate to one another.

Figure 2 depicts this conceptual organization. Tables S1-S3 summarize more than 325 interventions within these families. These studies were culled from prior empirical and review

articles and a February 2018 PsychInfo search combining “intervention” with diverse journals.¹ We retained studies that (1) featured one or more psychologically precise independent variables that addressed subjective meaning-making; (2) assessed real-world behaviors, attitudes, or emotions of inherent importance to the person and/or society (this excludes studies that assessed only behavioral intentions or responses to a laboratory stimulus); and (3) were evaluated in a randomized controlled trial. We have also placed these tables in a searchable online database to which researchers can add, providing a systematic up-to-date resource for the field (URL). Here we summarize prototypical examples in each family. While it is not our purpose to formally evaluate each intervention, it is important to note that all of the studies described here rest on a substantive theoretical and empirical base. Nonetheless, the evidence base for specific approaches in specific problem spaces varies, from large areas pursued by many researchers (e.g., growth-mindset of intelligence to raise adolescent achievement), to multiple replications and extensions, to single tests, as we denote (*EB 3*, *EB 2*, and *EB 1*; “EB” stands for “evidence base”). The supplementary tables show in detail which interventions have been investigated more versus less and the results obtained. That said, psychological interventions are not magic bullets—they will not work anytime, in any form (Yeager & Walton, 2011). Instead, as we have emphasized, they depend for their effectiveness on details of their implementation and the nature of the context. Here and later we also discuss meaningful failures and how they inform theory. For each study, we indicate in italics the specific change strategy used.

¹ *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.*

Figure 2. Conceptual map of psychologically wise interventions. Specific interventions (more than 325) are summarized in Tables S1-S3. Need-to-understand interventions (orange) capitalize on people’s motivation to develop reasonable understandings of themselves, other people, and the world around them. Because there are many targets (or objects of judgment) people must make sense of, interventions in this category are organized by types of targets—aspects of selves, both one’s own and others’; other people and groups; and personal and social situations. Need for self-integrity (black) and need-to-belong interventions (green) both capitalize on the fact that there are meanings people desire or are threatened by. Interventions in these categories either remedy threats to desired meanings to improve functioning or link desired meanings to specific behaviors to motivate positive change. Need for self-integrity interventions focus on people’s desire to think well of themselves—to believe they are adequate, moral, competent, and coherent. Need-to-belong interventions focus on people’s desire to feel connected to others: to be accepted and included, to be valued members of social groups, and to contribute positively to the lives of others. Because interventions can draw on multiple motivations, the map is not an exclusive taxonomy and interventions can fall in multiple categories. However, the map organizes diverse interventions and informs how they relate to one another.



1. Psychologically Wise Interventions that Capitalize on the Need to Understand

Many interventions aim to help people interpret themselves and their circumstances in adaptive ways by capitalizing on the need to make sense of matters as best they can. These studies draw primarily on attribution theory, which assumes that people try to form rational impressions of the causes of their own and other people's behavior (Weiner, 1985). They thus assume that people are responsive to information and experiences that suggest new ways of thinking. Because there is typically no single simple truth about subjective meanings, and because people's views readily become self-fulfilling, this approach is less concerned with whether people's interpretations are accurate in some objective sense than with facilitating reasonable perspectives that help people flourish (Abramson, Seligman, & Teasdale, 1978). We organize this section by the type of target (or object of judgment) the intervention focuses on— inferences about the self (including one's identity, emotions, and goals, and whether aspects of the self can change); other people (e.g., relationship partners and social groups); and personal and social situations (such as the purpose of schoolwork and the meaning of personal conflicts).

The self, both oneself and selves in general.

Changing self-identity. People strive to act consistently with their self-concepts; thus changing how people make sense of their self-identity can lead people to behave accordingly (Oyserman, Smith, & Elmore, 2014). Sometimes this can be achieved with *direct labeling*. In one study, 5th graders told by a teacher and a principal they were “litter-conscious” were less likely to litter 7 weeks later than children asked not to litter, apparently having internalized the label (*EB 1*, Miller et al., 1975). Other interventions forecast who people could become, motivating them to behave in ways that realize desired identities (e.g., Oyserman, Bybee, & Terry, 2006). Using *prompting with leading questions*, one study found that asking potential

voters questions like, “How important is it to you to be a voter in tomorrow’s election?” led to higher turnout the next day than questions like, “How important is it to you to vote in tomorrow’s election?” (EB 2, Bryan, Walton, Rogers, & Dweck, 2011). “Being a voter” transformed an errand into an opportunity to become a valued kind of person. Others represent who people do not want to be, become, or be confused with (*prompting with information*), which, for instance, can moderate negative intergroup attitudes in conflicts (EB 2, Hameiri et al., 2016; see also Berger & Rand, 2008).

Changing beliefs about emotions, states, and the valence of the self. Many studies test exercises to help people see themselves positively, such as to visualize their best positive selves or to reflect on things they are grateful for (*active reflection on positive aspects of self*), which can improve well-being and outcomes that flow from positive emotions including better health (EB 3, e.g., Emmons & McCullough, 2003; Sheldon & Lyubomirsky, 2006; for reviews, see Fredrickson, 2001; Layous & Lyubormirsky, 2014; Quoidbach, Mikolajczak, & Gross, 2015).

Other interventions address beliefs about emotions. When people view a feeling or state as negative (e.g., as undermining of one’s goals) this can instigate worry that itself undermines functioning. Thus, teaching college students that physiological arousal can mean the body is getting ready to accomplish something important, not necessarily portend failure (*prompting with information*), can raise GRE performance up to three months later (EB 2, Jamieson, Mendes, Blackstock, & Schmader, 2010; see also Brady, Hard, & Gross, 2017). In another study, teaching financial professionals ways that stress can be enhancing (*prompting with information*) improved self-reported health and work skills several days later (EB 1, Crum, Salovey, & Achor, 2013).

Another approach asks people to write about negative experiences, which can help people organize and draw bounds around challenges, rendering them less overwhelming (*active*

reflection on a negative experience). In a seminal study, Pennebaker, Kiecolt-Glaser, and Glaser (1988) showed that having students write concretely about traumatic experiences a few minutes each day for several days improved health (e.g., fewer visits to the medical center) and well being over 6 weeks (*EB 3*, for a review, see Pennebaker, 1997). Subsequent investigators have used more directive exercises to maximize benefits (e.g., Ramirez & Beilock, 2011). For example, asking people to write about an experience of depression in a self-distanced perspective (“watch the experience unfold as if it were happening all over again to the distant you”), as opposed to a self-immersed perspective (“relive the situation as if it were happening to you all over again”), reduced depressed affect and recurring thoughts about the depression a week later (*EB 1*, Kross & Ayduk, 2008; see also Kross et al., 2014).

Changing beliefs about goals. *Implementation-intention interventions* help people think about when and where they will accomplish goals (*EB 3*, 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 (*prompting with leading questions*) raised this rate from 3% to 28%. Students did not need more reason to form the goal; they needed to plan how to implement it (for a large-scale test on flu shots, see Milkman, Beshears, Choi, Laibson, & Madrian, 2011).

Other interventions help people think about how they will achieve more complex goals. In *mental contrasting with implementation intentions* people identify a goal they want to achieve (such as in school over several weeks or months), obstacles that might prevent them from achieving this goal, and how they can overcome these obstacles (*active reflection on goals*). In one study, this raised 5th-grade students’ end-of-term grades and improved attendance and classroom behavior (*EB 3*, Duckworth, Kirby, Gollwitzer, & Oettingen, 2013; see also Chen et

al., 2017; Destin & Oyserman, 2010; Eskreis-Winkler et al., 2016; Morisano, Hirsh, Peterson, Pihl, & Shore, 2010; for cultural moderation, see Kizilcec & Cohen, 2017; for a health example, see Christiansen, Oettingen, Dahme, & Klinger, 2010; for a review, see Oettingen, 2012).

Another approach involves embedding cues to remind people of their goals in key situations (*EB 2*; Papies, 2016). Such cues can be most impactful when people's processing capacity is limited, as when people have been drinking (Steele & Josephs, 1990). In one study, undergraduates viewed a video about safer sex. Some were randomly assigned to wear a reminder bracelet, and asked to remember the dangers of unsafe sex whenever they looked at it (*prompting by altering situations*) (Dal Cin, MacDonald, Fong, Zanna, & Elton-Marshall, 2006). Five to seven weeks later, students reported on their last sexual experience. Among those who had not been drinking, 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, the improvement was even larger: 71% versus 36%. Providing a token of the safe-sex message to carry into situations where they might have unprotected sex changed students' behavior accordingly.

People often respond poorly to goals that feel forced upon them (e.g., Deci & Ryan, 2000). Thus, introducing a class lesson with "autonomy-supportive" language like "you can" and "if you choose" (*prompting by altering situations*) led to greater motivation and learning among high school and college students than language like "you should" and "you'd better" (*EB 2*, Vansteenkiste, Simons, Lens, Sheldon, et al., 2004). Likewise, being told to "eat your vegetables" can feel controlling. Turning this process on its head, another study encouraged adolescents to express their outrage at the manipulative marketing practices used by food companies to promote junk food that harms young children and the poor (*saying-is-believing*). This led students to select healthier snacks the next day (*EB 1*, Bryan, Yeager, et al., 2016).

Changing beliefs about ability or potential. People are unlikely to pursue goals if they doubt they will succeed (Bandura, 1997; Deci & Ryan, 2000). Moreover, this belief can become self-confirming, as a student who attributes a bad grade to a lack of ability may find it difficult to study for the next test ensuring another poor performance. *Attributional retraining interventions* aim to change people's attributions for the causes of struggles to factors they can control or that improve with time (EB 3). Some approaches are direct, such as teaching about attribution theory (*direct labeling*) (Perry & Hamm, 2017). Others prompt adaptive attributions indirectly by sharing stories of challenges older students faced and overcame (*prompting with information*). In a classic study, this raised grades and reduced the sophomore-year dropout rate among struggling first-year college students from 25% to 5% (Wilson & Linville, 1982; see Wilson, Damiani, & Shelton, 2002). In another study, encouraging older adults in a rehabilitation center to attribute the retention of physical function to controllable factors (e.g., effort) (*prompting with information*) increased their motivation to exercise, life satisfaction, and functioning (Weinberg, Hall & Sverdlik, 2015).

Promoting growth mindsets. As we have noted, the cultural belief that intelligence is fixed—that you either have it, or you don't—can lead people to attribute academic setbacks to inability. *Growth-mindset of intelligence interventions* convey, instead, that intelligence can grow with effort, good strategies, and help from others (*prompting with information*). This can raise grades (EB 3, e.g., Blackwell et al., 2007; Good et al., 2003), especially for struggling students for whom the meaning of academic setbacks is most pressing (Paunesku et al., 2015). Some versions incorporate *saying-is-believing*. Aronson and colleagues (2002), for instance, asked college students to advise struggling middle school students about a growth mindset. This raised the college students' semester grades.

Other people, social groups, and relationships.

Changing beliefs about others' potential to learn and grow. Just as people invest more in their own efforts when they believe themselves capable, so they invest more in others when they believe they are capable. Telling teachers that certain students are likely to “bloom” (*direct labeling*) can facilitate teaching that results in greater academic performance in those students (*EB 3*, Rosenthal & Jacobson, 1968), especially when this message comes early in the school year when teachers' impressions of students are still forming (Raudenbush, 1984).

Changing beliefs about social groups. The belief that growth is possible can also improve intergroup outcomes. When Israeli Jews and Palestinians learned that groups in general are capable of changing (*prompting with information*) they expressed more positive intergroup attitudes and greater willingness to compromise (*EB 2*, Halperin et al., 2011) and, in another sample, more conciliatory behavior over 6 months of intense conflict (Goldenberg et al., 2018).

Other interventions help people see connections with outgroups. In one study, door-to-door canvassers used a 10-minute conversation about transgender people to encourage residents to reflect on their own experiences being judged negatively for being different and how this might relate to the experiences of transgender people (*prompting with leading questions*). This reduced transphobia and increased relevant policy support up to three months later (*EB 1*, Broockman & Kalla, 2016). Another study structured a series of conversations between Latino and White undergraduates to facilitate self-disclosure and close friendships with the aim to reduce anxiety in intergroup interactions (*prompting by altering situations*). This led students with higher initial levels of prejudice to initiate more intergroup interactions over the next ten days (*EB 1*, Page-Gould, Mendoza-Denton, & Tropp, 2008).

Changing beliefs about how other people view the self. As have seen, exercises that

bolster confidence in a partner's love among people with low self-esteem can improve romantic relationships (*prompting with leading questions*, EB 2, Marigold et al., 2007, 2010).

Other interventions explore ways to defuse the threat people experience when they risk being seen through the lens of a negative intellectual stereotype (Steele, 1997). Thus, representing critical academic feedback as reflecting a teacher's high standards and confidence in the student's ability to meet that standard can increase trust and motivation among racial-minority students (*prompting by altering situations*, EB 2, Yeager, Purdie-Vaughns et al., 2014). Another study moved demographic queries, which can signal the relevance of one's race or gender (Steele & Aronson, 1995), from before to after the AP Calculus test (*prompting by altering situations*). This raised the percentage of girls who received AP credit from 32% to 38%, with the greatest benefits for African American girls (EB 1, Danaher & Crandall, 2008).

Personal and social situations.

Changing beliefs about personal experiences that lack meaning. When students see little value in schoolwork, they can disengage. In one study, asking high school students to write several times over a semester about how science material might be relevant or useful to them or someone they knew (*prompting with leading questions*) raised end-of-quarter grades among students who expected to do poorly (EB 3, Hulleman & Harackiewicz, 2010). As in other leading-question interventions, the query assumed the critical idea and prompted respondents to expound upon this. Just telling students that academic material is useful may not produce the same benefits, as this may increase pressure and as the reasons given may be less personally relevant (Canning & Harackiewicz, 2015; see also Harackiewicz et al., 2012, 2016). Later we will see related interventions that leverage social motivations to encourage people to invest more at work and in school (Grant, 2008; Grant et al., 2007; Yeager, Henderson, et al., 2014).

Changing beliefs in and about interpersonal conflicts. As we have seen, asking new mothers questions that encouraged them to view difficulties in parenting as normal problems to be solved—not evidence that she is a “bad mom” or that the child is “a bad baby” (*prompting with leading questions*)—reduced abuse during the child’s first year (*EB 2*, Bugental et al., 2002; see also Bugental, Beaulieu, et al., 2010; Bugental et al., 2012; Bugental, Schwartz, et al., 2010).

Another study asked couples to write three times, 7 minutes each time, over the course of a year about a conflict in their marriage, how “a neutral third party who wants the best for all” would think about the conflict, and how they could overcome barriers to taking this perspective (*active reflection on a negative experience*). Compared to a randomly assigned control condition, this 21-minute exercise halted a decline in marital satisfaction over the year (*EB 1*, Finkel, Slotter, Luchies, Walton, & Gross, 2013).

Summary. These interventions capitalized on people’s motivation to make sense of matters as best they could. Each exposed people to information, created new situations, or structured reflection exercises that implied a new view of themselves, others, or their circumstances.

2. Psychologically Wise Interventions that Capitalize on the Need for Self-Integrity

As we have noted, even as people strive to make sense of the world reasonably, they desire or are threatened by certain meanings. Among these is the desire to see oneself as decent, moral, competent, and coherent. 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). Because interventions in this family all address the same high-level object of judgment—the adequacy of the self—we organize this section by their goal: whether to remedy a threat to self-integrity (typically through value-affirmation) or to link a behavior to the self to motivate

positive change (typically through strategies based in dissonance theory; see the first column of Table 2).

Remedying threats to self-integrity that undermine functioning through value-affirmation. Events routinely threaten people’s sense of adequacy, such as a news story that a habit (e.g., smoking) imperils one’s health, an upcoming test one might fail, or a stereotype that casts one’s group in a negative light. Experiences like these can undermine people’s desired view of themselves as good and competent in general, increasing stress and undermining well-being, and lead people to act in maladaptive or self-destructive ways, such as to deny the validity of health risk information (Sherman, Nelson, & Steele, 2000).

To help people function more effectively in the face of threat, value-affirmation interventions encourage people to reflect on enduring positive aspects of themselves (Sherman & Cohen, 2006; Steele 1988). In a typical exercise, people review a list of values (e.g., relationships with friends and family, artistic ability), identify one that is most important to them, and describe why. This is not hollow self-esteem boosting; value affirmations do not build people up with false praise or exaggerated self-views. Rather, reflecting on personal values of enduring importance helps people focus on ways they are worthy, competent people in areas of their lives beyond that which is threatened. In so doing, value affirmations “lower the heat,” place a specific negative event or experience in a broader context, 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 break this cycle to cause enduring benefits (Cohen et al., 2009).

Remedying identity threat. Threats to self-integrity arise in many aspects of life, so affirmation can help in many areas. An especially important and well-researched context involves social-identity threat (*EB 3*). The fear that one could be viewed through the lens of a negative stereotype can heighten anxiety and become distracting, ironically making it harder to perform well (Steele, 1997, 2010; Steele, Spencer, & Aronson, 2002; Schmader, Johns, & Forbes, 2008; Walton & Spencer, 2009). Following laboratory experiments (Martens, Johns, Greenberg, & Schimel, 2006), field experiments found that African American students who completed value affirmations as in-class writing exercises at the beginning of 7th grade showed reduced accessibility of negative stereotypes and higher course grades that term, reducing race differences by 40% (Cohen et al., 2006). These gains in grades 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). Moreover, as noted earlier, by helping students enter higher-performance tracks, affirmation interventions can promote students' entry into college 6 years later (Goyer, Garcia, et al., 2017).

Value-affirmation interventions are designed to remedy threat to the self and thus squarely address the need for self-integrity. However, they also support belonging. Developing strong relationships may be difficult if one feels like a token of a negatively stereotyped group (Walton & Brady, 2017). Indeed, in one study value-affirmation led African American adolescents to develop a more secure sense of belonging in school over two years as compared to the randomized control group (Cook et al., 2012), illustrating how an intervention can address needs for self-integrity and belonging at once.

Other studies have tested ways to scale value-affirmation interventions to larger populations (Borman, Grigg, & Hanselman, 2016; Dee, 2015; Hanselman, Bruch, Gamoran, &

Borman, 2014), such as in online learning platforms (Kizilcec, Saltarelli, Reich, & Cohen, 2017), and have benefited undergraduate women in science and engineering (Miyake et al., 2010; Walton et al., 2015), first-generation college students in biology (Harackiewicz et al., 2014; Tibbetts et al., 2016), and Latino American college students (Brady et al., 2016), with gains in college GPA lasting up to 2 years.

Remedying other threats. Elsewhere, value-affirmation interventions have increased the acceptance of information about health risks, such as of drinking and smoking, which can otherwise provoke defensiveness (*EB 3*, Harris et al., 2007); mitigated health-risk behaviors (*EB 2*, Armitage, Harris, & Arden, 2011; Ehret & Sherman, 2018; Falk et al., 2015); led people in poverty to accept information about public benefits (*EB 1*, Hall, Zhao, & Shafir, 2014); reduced physiological stress as a major exam approaches (*EB 1*, Sherman, Bunyan, Creswell, & Jaremka, 2009); and improved interpersonal relationships over several months among those for whom such relationships are at risk, such as among socially insecure college students (*EB 2*, Stinson, Logel, Shepherd, & Zanna, 2011).

Discussion. Although value affirmation is one of the most heavily researched wise interventions, it is also one of the most complex. In some cases, it has failed to raise achievement among students who face identity threat (Dee, 2015; Harackiewicz et al., 2016). Analyses suggest that it is more likely to help when threat is greater, such as when achievement gaps are large or when a target group is underrepresented (Hanselman et al., 2014; Walton et al., 2015; compare Harackiewicz et al., 2014 and Harackiewicz et al., 2016). There are also strong theoretical and empirical reasons to think that affirmation will backfire in certain circumstances. Laboratory research finds that affirmation can lead people to disengage from goals on which they are failing, presumably by allowing people to accept that they are bad at the task and so feel okay about

disengaging (Vohs, Park, & Schmeichel, 2012). In field settings, ironic effects may be more likely when the domain is not very important to people and they can easily exit. In one study of online learning, a value affirmation intervention increased course completions for students from less developed countries, theorized to experience identity threat. However, affirmation simultaneously *decreased* course completions for students from more developed countries (Kizilcec et al., 2017). Thus, when people value relevant goals and/or are obliged to persist in a setting but face persistent identity threat, value affirmation may help them succeed. But when people do not adequately value a behavior and can exit, alternative strategies may be better, such as those that link a behavior to core concerns of the self, as we discuss next.

Linking self-integrity to specific behaviors to motivate positive change. Drawing on dissonance theory, other interventions create circumstances that make a positive behavior seem important to being a good and coherent person, motivating change (bottom left-hand corner of Table 2). These strategies involve various forms of *increasing commitment through action*.

Table 2. Two ways to address needs for self-integrity and to belong to produce positive change.

	Desired Meanings	
Approach	The Need for Self-Integrity	The Need to Belong
Remedy Threat to a Desired Meaning That Undermines Functioning	<ul style="list-style-type: none"> • Value-affirmation to remedy threats to self-integrity 	<ul style="list-style-type: none"> • Bolster beliefs about social connectedness • Facilitate beliefs that sustain belonging in the face of challenges
Link Desired Meaning to a Specific Behavior to Motivate Positive Change	<ul style="list-style-type: none"> • Pre-commitment • Effort justification • Hypocrisy 	<ul style="list-style-type: none"> • Link social connections and feelings of belonging to goal pursuits • Change beliefs about social norms to

	• Counter-attitudinal behaviors	motivate positive behaviors
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Earlier we reviewed interventions to help people follow through on their goals (i.e., implementation intentions, Gollwitzer, 1999). Connecting a goal to issues of self-integrity can also deepen people's commitment to it. One approach, termed *pre-commitment*, is to encourage people to freely commit to a future behavior. This can increase the odds they follow through because not doing so would seem inconsistent (Freedman & Fraser, 1966; Lewin, 1958). Thus, 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 (Moriarty, 1975). In one intervention, placing the signature line at the top rather than the bottom of a car insurance form—making people commit to truth-telling upfront—led motorists to disclose having driven 10% more miles (26,098 vs. 23,671), increasing payments and fairness (*EB 1*, Shu et al., 2012; for a qualification, see Gollwitzer, Sheeran, Michalski, & Seifert, 2009). A variant is to induce people to put forth more effort toward a goal, which can increase commitment to the goal by making people justify this effort (*effort justification*; Aronson & Mills, 1959). In one study, overweight undergraduates were told that a series of very difficult perceptual and cognitive tasks would help them lose weight. A year later they had lost an average of 6 pounds more than students for whom the tasks were easy (*EB 1*, Axsom & Cooper, 1985). In each case, promoting people's commitment to a goal increased the likelihood that they followed through.

Other interventions go beyond commitment to highlight how people's behavior does not live up to their own standards (*hypocrisy*), which can motivate positive change. In a variation of the saying-is-believing technique, college students were asked to advocate for safe sex to high school students and, in addition, to recall times they had not practiced safe sex themselves. As compared to both students who only advocated for safe sex (who can see themselves as

exemplary) and students who only recalled their own inconsistent past practice (who can see unsafe sex as not a big deal), those in the hypocrisy condition subsequently purchased more condoms (*EB 2*, Stone et al., 1994; for an application to intergroup relations, see Rokeach, 1971).

The motivation to see oneself as consistent also means that inducing people to freely act in ways that contradict a problematic attitude can motivate change in that attitude (*counter-attitudinal behavior*; Festinger & Carlsmith, 1959). One study led Asian and White students to feel socially connected to a Mexican-American partner, disposing them to share her interests. Students were then invited to work with this peer to design a music video for a Mexican band she liked (*EB 2*, Brannon & Walton, 2013). Later, students showed reduced implicit prejudice against Latinos and, six months later, greater interest in talking with Mexican American peers. These gains did not occur when students were connected to the peer but designed a video for a non-Mexican band with her; that behavior was not inconsistent with prejudicial attitudes. They also did not occur when students were not connected to the peer; then they did not show the same interest in designing the music video. The improvements arose only when students could see themselves as freely acting in a way that contradicted prejudicial attitudes.

Summary. The interventions discussed in this section either reduced threats to self-integrity via value-affirmation or linked self-integrity to specific behaviors to promote positive change. Given the potential iatrogenic effects of value-affirmation, however, interventions that address the need for self-integrity should in particular proceed with care and rigorous evaluation.

3. Psychologically Wise Interventions that Capitalize on the Need to Belong

A third family of interventions capitalizes on people's need to see themselves as connected to others so as to improve outcomes that go beyond a relationship or a sense of belonging itself, such as to improve well-being, health, or achievement.

Remedying threats to belonging that undermine functioning.

Bolstering beliefs about social connectedness. Even symbolic gestures can create a sense of social connectedness, especially when people feel disconnected (Walton & Brady, 2017). In one study, receiving periodic caring notes from a hospital following a suicidal or depressive incident (*prompting by altering situations*) reduced suicide rates from 3.52% to 1.80% over two years (*EB 2*, Motto & Bostrom, 2001; see also Carter et al., 2013). Illustrating the meaning these notes had 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” (p. 832). Other interventions help people take acts that bolster a sense of social connectedness (*EB 3*), performing kind acts (*prompting by altering situations*; Dunn, Aknin, & Norton, 2008; Nelson-Coffey, Fritz, Lyubomirsky, & Cole, 2017), reflecting on their kind acts (*active reflection on a positive aspect of self*; Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006), or expressing gratitude to others (*active reflection on a positive aspect of self*; Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011), which can improve well-being and health. Reminding people of secure relationships can also protect against later threats. In one study, asking adolescents to reflect on experiences of unconditional regard from peers (*active reflection on a positive aspect of self*) reduced the shame they felt several weeks later if they received poor grades (*EB 1*, Brummelman et al., 2014).

Facilitating beliefs that sustain belonging in the face of challenges. The *social-belonging intervention* leverages the need to understand to help students see that worries about belonging early in an academic transition are normal and improve with time, typically using *saying-is-believing* (*EB 3*, Walton & Cohen, 2011). Clearly this intervention belongs here as well, however, because it aims to facilitate beliefs that protect a sense of belonging to improve

students' academic experience. A related approach, *difference-education*, helps first-generation college students think about unique challenges students like them face in college and how they can overcome them. In one study, a panel discussion addressing these themes (*prompting with information*) raised first-year grades for first-generation students at a selective college, reducing the social-class achievement gap by 63% (*EB 1*, Stephens, Hamedani, & Destin, 2014).

Being bullied in school is a threatening experience, yet it is especially aversive if students think that this is a permanent state or identity. Drawing on growth-mindset of intelligence interventions, *theory-of-personality interventions* encourage the belief that people can change and thus that bullies need not always be bullies and victims need not always be victims (*saying-is-believing*). In one study, this message lowered stress, reduced physical illness, and raised grades among 9th grade students over 8 months (*EB 2*, Yeager, Johnson, et al., 2014).

Institutional messages can also convey or alleviate a lack of belonging. Another study revised a letter a college sent to students notifying them of their placement on academic probation to explicitly affirm its belief that reasonable challenges (not inherent deficiencies) cause students' struggles and its confidence that students can meet those challenge with appropriate supports (*direct labeling*). This mitigated students' feelings of shame and stigma, increased the likelihood they reached out promptly to advisors, and raised the percentage who returned to good standing a year later from 26% to 43% (*EB 1*, Brady et al., in prep A).

Linking specific behaviors to belonging to motivate positive change.

Linking goal pursuits to social connections and belonging. Leading people to view their work toward a goal as part of a team effort can enhance motivation (Carr & Walton, 2014; Coch & French, 1948; Walton, Cohen, Cwir, & Spencer, 2012). In one study, asking adults to form *collaborative implementation-intentions*—planning with a partner when to exercise together

(*prompting with leading questions*)—increased physical activity and weight loss 6 months later relative to both a control condition and a personal implementation-intention condition (EB 2, Prestwich et al., 2012; Wing & Jeffery, 1999). In another, giving 9th-grade teachers information about values they shared with specific students (*prompting with information*) raised course grades among African American and Hispanic students, reducing the racial achievement gap by 60% (EB 1, Gehlbach et al., 2016; see also Grant & Gino, 2010).

Other interventions represent a behavior as a way to help others. One study manipulated whether a sign on hospital soap dispensers urged medical professionals to wash their hands to protect their own health or their patients' health (*prompting by altering situations*) (EB 1, Grant & Hofmann, 2011). The patient-focused sign increased the rate of hand washing from 81% to 89% over 2 weeks with no change for the self-focused signs. In another, meeting with a scholarship recipient (*prompting by altering situations*) led university fundraisers to raise 171% more money over the next month (EB 2, Grant et al., 2007; see also Grant, 2008). The *pro-social purpose intervention* asks students to identify a social problem important to them and to share how their desire to make a difference motivates them to work hard and learn in school (*saying-is-believing*). This increased effort on tedious but foundational learning tasks and raised grades in high school math and science, with the largest benefits for initially low-performing students (EB 2, Yeager, Henderson, et al., 2014).

A final study merged value-affirmation with social motivations to help smokers quit. Smokers were asked to reflect on a personally important value they shared with a close friend or family member who supported their intention to quit (*goal-contingent value-affirmation*) (EB 1, Fotuhi, Logel, Spencer, Fong, & Zanna, 2014). This exercise both allays a threat to self-integrity posed by the health risks of smoking and links belonging to behavior change. It increased the

percentage of smokers who had quit 6 months later (36% did so), as compared to both a control condition (1%) and a standard value-affirmation (16%).

All of the studies in this section paired an important goal with people's desire to see themselves as socially connected to promote change.

Changing beliefs about social norms to motivate positive behaviors. Other interventions change perceptions of what is normative; that is, what kinds of behavior are typical or valued in a person's community or context. A classic intervention used small-group discussions to encourage middle-class housewives to serve organ meats during the meat shortages of World War II. The discussion focused on how "housewives like themselves" could do so, and obstacles they would face. At the end, the facilitator asked for a show of hands of who would serve organ meats in the next week, encouraging people to commit to doing so and facilitating a new perceived group norm (*prompting by altering situations*). Compared to a condition in which women heard lecture appeals about the benefits of serving organ meats, the discussion raised the percentage of women who actually did over the next week from 3% to 32% (*EB 2*, Lewin, 1958).

In a more recent study, letters urged more than 100,000 delinquent taxpayers to pay their taxes. The most effective letter provided the strongest norm statement ("Nine out of ten people... pay their taxes on time. You are currently in the very small minority of people who have not paid us yet") (*direct labeling*). It raised an additional £1.9 million (\approx \$2.73 million) in revenue over 23 days (*EB 1*, Hallsworth, List, Metcalfe, & Vlaev, 2014). Other studies find that social-norm information embedded in utility bills—including both descriptive (how much energy people used relative to neighbors) and prescriptive information (social approval for reducing energy use) (*direct labeling*)—reduced home energy use (*EB 2*, Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007), especially among high users (Allcott, 2011). In another, a radio soap opera

featuring stories of positive intergroup relationships to change beliefs about what is normative (*prompting with information*) improved intergroup attitudes in post-genocidal Rwanda (*EB 1*, Paluck, 2009). Another randomized 34 crime hotspots to “broken-windows” policing—cleaning up graffiti and other signs of disorder to signal that rule breaking was unacceptable (*prompting by altering situations*). This reduced citizen 911 calls by 20% over 6 months relative to matched hotspots that received standard policing (*EB 2*, Braga & Bond, 2008). A final study increased the rate at which hotel guests reused towels by conveying that many others did so (*direct labeling*, *EB 2*, “Almost 75% of guests...[reuse] their towels more than once,” Goldstein et al., 2008).

Normative appeals alone, however, can make people feel pressured to change, undermining their effectiveness (Jung, Shim, & Mantaro, 2010). Notably, the Goldstein study paired normative information with the message that the norm offered an opportunity to work together toward a common goal (“JOIN YOUR FELLOW GUESTS IN HELPING TO SAVE THE ENVIRONMENT,” capitalized in the original). Separating these elements to highlight the role of belonging, another study found that an appeal containing just normative information (“65% of people...have reduced their paper towel use”) caused no reduction in paper towel use in public restrooms, in part because people felt pressured. But when the appeal invited people to “join in” and “do it together” (*direct labeling*) usage dropped by 14% (*working-together norms*; *EB 1*, Howe, Carr, & Walton, under review).

In all these examples, people were exposed to evidence that positive behaviors were normative. What about when the norm is negative? One approach to such cases is to show ways the norm is not as negative as it might seem. In a classic example, excess drinking can appear more common and accepted in college than it really is, a misperception that can motivate students to drink more in conformity to the perceived norm (Prentice & Miller, 1993). Then,

representing other students as less comfortable with drinking than they appear (*prompting with information*) can reduce drinking (EB 2, DeJong et al., 2006; Schroeder & Prentice, 1998), although there is also mixed evidence for this approach (DeJong et al., 2009; see also Perkins, 2003; Rodriguez et al., 2015). In some cases, this approach does not alter the perceived norm so much as delegitimize it so people feel less compelled to conform to it (Schroeder & Prentice, 1998). Likewise, challenging the legitimacy of norms about thinness in media representations (*saying-is-believing*) can improve adolescent girls' body image (Strahan et al., 2008).

Another approach is to draw people's attention to improvement in a norm even if it is currently negative (*dynamic norms*; cf. Lewin, 1958). In one study, informing lunch goers that a growing minority of people are making an effort to limit their meat consumption (*direct labeling*) doubled the percentage who ordered lunch without meat (34%), as compared to both a static-norm condition (17%) and a neutral control condition (21%) (EB 2, Sparkman & Walton, 2017). In part this effect arose because people conformed to an anticipated altered future norm.

Summary

As we have noted, interventions can draw on multiple motivations for meaning making (Cook et al., 2012; Lewin, 1958; Fotuhi et al., 2014; Walton & Cohen, 2011). Indeed, it may be that the most effective interventions take an eclectic approach, leveraging multiple motivations and strategies for change. Before designing an intervention, however, researchers should be clear about which motivations are at play and which strategies will be most effective at encouraging adaptive changes in meaning and behavior.

VI. Relationship to Situation- and Person-Centric Approaches to Social Reform

As mentioned earlier, two broad theoretical approaches have guided much social reform, often effectively. Person-centric approaches attribute poor outcomes to a deficiency or lack of

capacity in people, and assume that the best way to improve outcomes is to build this capacity. These “capacities” may include cognitive abilities, self-control, or specific automatic associations. Interventions may involve education in general (Brinch & Galloway, 2011) or programs to promote specific qualities (e.g., intelligence, Jaeggi, Buschkuhl, Jonides, & Perrig, 2008). Situation-centric approaches assume that to flourish people need to be in situations that help them succeed rather than that hinder them (Sachs, 2005). This might involve increasing resources for schools, moving families to neighborhoods that provide greater opportunities (Sanbonmatsu et al., 2011), altering incentive structures (Fryer, 2011), or making better choices easier (Thaler & Sunstein, 2008). While both approaches have led to effective reforms, we suggest that both may be enhanced with a consideration of subjective meaning making. Every event—from a change in a situation to an effort to build skills—is subject to interpretation, and the meaning people draw can increase or decrease the effectiveness of reforms.

Changing Situations

Resources and meaning making. It is enormously important to mitigate discrimination and poverty and improve adverse circumstances. Yet even in stark, unwelcoming environments interpretations matter. Fifty-years ago, the seminal Coleman Report explained large variation in achievement within schools in part as a problem of meaning-making: 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...is a change in this conception” (Coleman et al., 1966, p. 321).

Consistent with this theorizing, the negative effects of poverty are exacerbated by negative beliefs and meanings. A mediator of poor achievement in poorer schools is lower levels

of trust (Goddard, Salloum, & Berebitsky, 2016). And one cause of poor motivation among low-income racial minority adolescents is the belief that college is inaccessible to them; thus, providing information about need-based financial aid can help (Destin & Oyserman, 2009). Another study of all 10th graders in Chile ($N=168,552$) found that students from lower income families were more likely to endorse a fixed mindset about intelligence, and this predicted lower achievement test scores (Claro, Paunesku, & Dweck, 2016). By inspiring more adaptive beliefs about intelligence, growth-mindset interventions may mitigate one pathway through which structural inequalities undermine educational outcomes (Outes, Sanchez, Vakis, 2017; Yeager, Walton, et al., 2016). Attempts to improve contexts and attempts to change interpretations within existing environments are each important and can be pursued simultaneously.

People's interpretations of specific resources also matter and, as we have noted, can be changed to improve outcomes (e.g., Bandura & Schunk, 1981). One study found that pharmacological drugs (e.g., morphine, anti-anxiety drugs) are much more effective when their injection is visible rather than invisible, presumably because expectations people hold enhance their effectiveness (Benedetti et al., 2003; see Crum, Leibowitz, & Verghese, 2017; Moerman, 2002; Wager & Atlas, 2015). Likewise, helping people see critical academic feedback (Yeager, Purdie-Vaughns, et al., 2014), health-risk information (Dal Cin et al., 2006; Ehret & Sherman, 2014; Stone et al., 1994), remedial help (Brady et al., in prep A; Graham & Barker, 1990), and public benefits (Hall et al., 2014) as resources for improvement—rather than as irrelevant or a negative judgment—can help people take advantage of these opportunities. And helping people see intergroup contact as an opportunity to grow and learn, rather than as irrelevant, a competition, or evaluative, can improve intergroup outcomes (Aronson & Osherow, 1980; Brannon & Walton, 2013; Mallett & Wilson, 2010; Rokeach, 1971; Page-Gould et al., 2008; see

also Carr, Dweck, & Pauker, 2012).

Incentives and meaning making. One of the most common ways to change behavior is to incentivize people to act in a particular way. But like resources, incentives are subject to meaning making, and this can produce ironic effects (Lepper, Greene, & Nisbett, 1973). In a classic example, a fine imposed on parents who picked their children up late at a day care increased late pick-ups—presumably because the fine came to be regarded as a fee for service, undermining parents’ motivation to be good community members and come on time (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 further misbehavior (Okonofua, Walton et al., 2016; Skiba & Losen, 2015). In one study, encouraging teachers to adopt an empathic rather than a punitive mindset about misbehavior cut suspension rates among a diverse group of middle school students by half over a school year (Okonofua, Paunesku, et al., 2016).

Even when incentives work as intended they may do so through meanings they inspire. One study 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 children’s school attendance and learning but the largest benefits were observed when the transfers were merely labeled educational supports. The cash did not function as an incentive. Instead, the government endorsement of education, conveyed through the cash and label, led parents to see education as important for their children’s future and increased confidence in the quality of local schools. Understanding the meanings conveyed through incentives can maximize their benefits.

Incentive schemes fundamentally presume that people are inadequately motivated to engage in the behavior incentivized. Yet often people want to behave well but lack effective ways to manage critical meanings. This may be why incentives given to teachers to improve student outcomes are often ineffective; many teachers already want to help students (Fryer, 2011). But helping teachers find ways to build trust and facilitate productive mindsets in students can promote learning (Andersen & Nielsen, 2016; Gehlbach et al., 2016; Lepper, Woolverton, Mumme, & Gurtner, 1993; Okonofua, Paunesku, et al., 2016; Outes et al., 2017).

Behavioral nudges and meaning-making. 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 behaviors or decisions more likely and others 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 (opt in) versus having to indicate an unwillingness to do so (opt out). Changing the status quo (e.g., making organ donation the default) can have large impacts on 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 effective ways of changing behavior on a large scale. Both the British and United States governments have established “nudge units” in which psychologists and behavioral economists seek more effective ways of delivering policies and services by making small changes to situations (Benartzi et al., 2017; Service et al., 2014).

Nudges are similar to wise interventions in important respects, including the idea that seemingly small changes can bring about large changes in behavior. But there are also 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, rather than considering what meanings and interpretations might explain people's behavior and how these meanings arise. Yet the more people's responses to situations are understood in terms of psychological theory—especially the meanings people infer, desire, and are threatened by—the more effective these changes may be (see Paluck & Shafir, 2017).

For example, why does setting the default to be an organ donor increase donation rates (Johnson & Goldstein, 2003)? It is easy to think that this simply makes becoming a donor easier. But defaults also convey norms. When the default is not to donate, people think of organ donation as a major sacrifice, equivalent to giving away half their wealth. When the default is to donate, people consider it more a common courtesy, like letting others go ahead in line, a change in meaning that lowers the bar to being a donor (Davidai, Gilovich, & Ross, 2012).

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 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? Without theories about meaning making, researchers would be mute in making predictions; indeed, they would probably never pose these questions in the first place. As we have seen, however, psychological theories suggest answers to all these questions, and these can be tested in empirical research.

A narrow focus on situations carries another important limitation: Change may not generalize to new situations. Changing the display of foods may increase healthy choices in one

cafeteria but not alter behavior elsewhere (Hanks, Just, Smith, & Wansink, 2010). Certainly, sometimes change in one situation can unlock resources that support change later. Simplifying a financial aid application, for example, can help more students pursue college, setting a new trajectory (Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012). However, many problems, such as raising achievement or improving a marriage, require sustained change in many behaviors over long periods of time in diverse situations. To address these problems, it is necessary to understand what people take with them as they move from one situation to the next. Inferences people draw about themselves and social situations, such as a belief in the potential for change, can apply widely. Moreover, in time inferences can become embedded in the structure of people's lives and, thus, self-fulfilling (Figure 1). Indeed, as we have seen, brief exercises that address subjective meaning making increased the likelihood African American adolescents attended college six years later (Goyer, Garcia et al., 2017) and raised African American college students' life and career satisfaction nearly a decade later (Brady et al., in prep B).

Changing People

Because people differ in various qualities—ability, self-control, grit—and because these qualities can predict future outcomes (e.g., Duckworth & Seligman, 2005; Duckworth, Peterson, Matthews, & Kelly, 2007; Mischel, Shoda, & Rodriguez, 1989; Moffitt, et al., 2011), person-centric interventions aim to enhance critical capacities or remedy deficiencies. An important advantage is that, in theory, the person can acquire new capacities that benefit them across a wide range of situations. In contrast, wise interventions address people's beliefs and inferences *about* themselves and social situations (Dweck, 2008).

Personal skills and meaning-making. 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 such an intervention. Schooling promotes the development of cognitive abilities (Brod, Bunge, & Shing, 2017; Brinch & Galloway, 2011; Duyme, Dumaret, & Tomkiewicz, 1999; see Nisbett et al., 2012). High-quality preschool programs can enhance children's readiness for school (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Woodhead, 1988). Social competencies can also be built through long-term intervention (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, psychiatric problems and convictions for substance abuse and violent crimes (Conduct Problems Prevention Research Group, 2015; see also Yeager, 2017).

Other interventions aim to build specific skills. 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; see also Rybanska, McKay, Jong, & Whitehouse, 2017; Sasser, Bierman, Heinrichs, & Nix, 2017; for related work with adults, see Baumeister, Gailliot, DeWall, & Oaten, 2006; Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). Encouraging mothers to talk more with their infants and toddlers increased children's vocabulary and language production a year later, an important aspect of school readiness (Weber, Fernald, & Diop, 2017).

These studies underscore the value of theory-based interventions to enhance specific capacities. However, some caution is in order. Although multifaceted interventions have improved everyday functioning (e.g., Conduct Problems Prevention Research Group, 2015; Gertler et al., 2014; Sasser et al., 2017), and correlational evidence linking specific capacities to

life outcomes is strong, there is less evidence that narrowly targeted exercises to enhance specific cognitive or self-regulatory capacities improve life outcomes, such as school achievement, work performance, competence in everyday tasks, health, relationships, or well-being over time (cf. Edwards et al., 2017). Proxy measures like intelligence test scores (Jaeggi et al., 2008) can be increased by well-designed interventions. But these are not outcomes of importance unto themselves (Sternberg, 2008). For example, there is controversy about whether cognitive-training programs (e.g., working-memory training, self-control training) enhance broad capacities or cause narrow improvement in task performance (Diamond & Ling, in press; Inzlicht & Berkman, 2015; Jaeggi, Karbach, & Strobach, 2017; Melby-Lervåg & Hulme, 2013; Miles et al., 2016; Shipstead, Redick, & Engle, 2012; Simons et al., 2016).

Further, in cases in which precise capacity-training interventions have improved life outcomes, meaning making may play a role. One self-control training intervention—effortfully squeezing a handgrip twice a day for 2 weeks—raised students' end-of-year GPA 7 months later (Job, Friese, & Bernecker, 2015). Yet there was no evidence of improved self-control skills. Instead, the gains were mediated by a reduction in students' reports of the extent to which they avoided putting forth effort in their studies. Perhaps the intervention worked by facilitating beliefs about the value of effort. Certainly, experiences building core skills can change important beliefs and self-beliefs (e.g., Bandura & Schunk, 1981).

Thus, as with situation-centric interventions, person-centric ones may benefit from a direct consideration of meaning making (Diamond & Ling, in press). Consider self-control, which is commonly understood as a trait that people possess to varying extents, which may be increased through practice on challenging tasks (Diamond & Lee, 2011). Yet the likelihood that people evince self-control also varies with their interpretations. Laboratory experiments find that

children are far more likely to delay gratification when situational cues imply that these efforts really will pay off (Kidd, Palmeri, & Aslin, 2013). If life settings cannot be counted on to reward waiting why should people do so even when they could (Coleman et al., 1966; Jachimowicz et al., 2017)? Other studies have found that exposure to a storybook character who learns that waiting can be energizing instead of depleting led children to adopt more effective waiting strategies and to wait longer in a delay of gratification task (Haimovitz, Dweck, & Walton, under review). Among adults, the belief that willpower rests on a limited, easily depleted resource undermines self-regulation as self-control demands mount (Job, Dweck, & Walton, 2010), and predicts worse self-regulatory outcomes (e.g., grades, Job, Walton, Bernecker, & Dweck, 2015). These studies do not point to increasing self-control itself through practice or some other means, but to people's *beliefs* about their environments or abilities.

Automatic associations and meaning-making. A variety of interventions aim to remedy maladaptive automatic associations or to instill positive ones, such as through the principles of conditioning (Watson, 1913; e.g., exposure therapy, McNally, 2007; see Broberg & Bernstein, 1987; Hammond et al., 2003, 2004). For instance, repeatedly pulling a joystick toward the self in response to images of racial minorities can reduce implicit prejudice (Phills, Kawakami, Tabi, Nadolny, & Inzlicht, 2011; see Eberl et al., 2013; Forbes & Schmader, 2010; Kawakami, Steele, Cifa, Phills, & Dovidio, 2008; Levy, Pilver, Chung, & Slade, 2014; Lindgren et al., 2015).

A challenge for exercises to change automatic associations, however, is that they may be diluted and fail in the long-term if everyday reality provides a robust contrary association—which may be why the maladaptive association exists in the first place (see Lai et al., 2016). By contrast, as we have noted, changing how people make sense of real-world experiences can set in motion new patterns of behavior and flows of experience that sustain change. In fact, when

interventions designed to remedy implicit prejudice have caused lasting benefits, they have not done so by changing automatic associations. Instead, they seem to work through subjective meaning-making. One intervention designed to remedy implicit gender bias among math, science, and engineering faculty caused no reduction in implicit bias. But by 3 months later the intervention had raised faculty members' awareness of gender bias and motivation to be non-biased, and improved feelings of fit and value in the department (Carnes et al., 2015). Moreover, over the next 2 years, the intervention marginally increased the hiring of female faculty (Devine et al., 2017). A similar intervention designed to reduce implicit racial bias also caused no lasting reduction in bias. Yet it raised concern about prejudice over 2 weeks and, 2 years later, increased the likelihood that participants objected to an essay endorsing racial stereotyping (Forscher, Mitamura, Dix, Cox, & Devine, 2017). In both cases, the long-term benefits may have arisen from the greater concern people felt about bias, rather than from changes in the biased associations themselves. Consistent with this conclusion, a meta-analysis found that even if small changes in implicit bias are possible these changes do not necessarily contribute to change in explicit bias or behavior (Forscher, Lai, et al., 2017; see also Burns, Montieith, & Parker, 2017).

Dosage and timing. If the goal is to build skills and/or to change associations, practice or repetition may be required (Diamond & Lee, 2011; Ericsson, Nandagopal, & Roring, 2009), and interventions may have dose-response effects (Jaeggi et al., 2008; Weicker, Villringer, & Thöne-Otto, 2016). But if the goal is to change meanings then a single dose that alters a recursive process may cause lasting change. Timing—early in a transition or experience—not dosage, may be more important for wise interventions (Canning et al., 2017; Cook et al., 2012; Raudenbush, 1984; Verplanken & Roy, 2016).

Combining Approaches

For people to flourish we need to create situations that support success (situation-centric reforms); to build critical skills and associations (person-centric reforms); and to address people's interpretations of themselves and social situations (psychologically wise interventions). How can these approaches be understood together and combined?

Because wise interventions help people take advantages of opportunities available to them (Table 1), they can help diagnose where capacity for improvement is present but unrealized due to maladaptive meanings and where capacity is inadequate. For instance, if a growth-mindset of intelligence intervention were ineffective in schools that are chaotic or under-resourced, this could imply structural reforms to enhance learning opportunities. Such efforts are already underway. The National Learning Mindset Study and the College Transition Collaborative are each testing mindset interventions with large samples of students in diverse high schools and colleges, allowing an examination of the contexts in which the interventions are more and less effective (Yeager, Hanselman et al., in prep).

Different approaches can thus be complementary. In the transition to college, a situation-centric approach might simplify the forms students need to complete to enroll; issue systematic reminders of key deadlines; increase financial aid; or provide information about selective colleges students could attend, helping students make better decisions (respectively: Bettinger et al., 2012; Castleman & Page, 2015; Goldrick-Rabb et al., 2012; Hoxby & Turner, 2014). These strategies address important barriers beyond those posed by subjective meaning; combining them with efforts to remedy feelings of inadequacy and nonbelonging may be especially effective.

Sometimes a single approach serves multiple functions. Setting defaults thoughtfully no doubt makes a personally and socially positive choice easier even as it also signals what is normative (see Dinner, Johnson, Goldstein, & Liu, 2011). Providing poor families cash as

educational supports expands opportunities even as it conveys the importance of education (Benhassine et al., 2015). Multi-component interventions often combine approaches. For instance, Fast Track, the 10-year program to promote social competencies (Conduct Problems Prevention Research Group, 2015), included social-skills training, parent groups, etc., but also had as a primary goal discouraging children from drawing global, hostile interpretations for negative peer events (see Hudley & Graham, 1993). Indeed, a measure of children's interpretations partially mediated the reduction in adolescent antisocial behavior (Dodge et al., 2013; see also Heller et al., 2015; Heller, Pollack, Ander, & Ludwig, 2013). Likewise, interventions that teach meditation or mindfulness practices help people cultivate emotion-regulation skills, but these skills help people reflect on experiences, thoughts, and feelings in more productive ways—promoting a change in meaning that improves health, well-being, and personal relationships (Creswell, 2017; Fredrickson et al., 2008).

As another example, the Information-Motivation-Behavioral Skills (IMB) model explicitly theorizes how multiple components can come together to improve health behavior (Fisher, Fisher, & Shuper, 2014). The model presumes that people need (1) an accurate understanding of how behaviors relate to a health problem; (2) adequate motivation to change; and (3) effective skills to put this motivation to work. Pilot research can inform which factor is most needed in a given context. Interventions may involve both psychologically wise approaches (e.g., to overturn folk myths that perpetuate ineffective behaviors, see Au et al., 2008; to mitigate the threat of health risk information, Sherman et al., 2000; to motivate change, Dal Cin et al., 2006; Stone et al., 1994) and teaching relevant skills (e.g., how to negotiate with a partner about condom use). Multicomponent interventions based on the IMB model have improved safe sex outcomes over periods of months in trials around the world (Fisher, Fisher et al., 2014). By

specifying the relationships among the key components, this model makes predictions about which components will be most important in what contexts and what adaptations are needed for different settings and problems.

Combining approaches, however, does not always increase the impact of an intervention; it often does not (Good et al., 2003; Paunesku et al., 2015; Yeager, Walton et al., 2016, Experiments 1 and 2). In some cases, different approaches may even promote competing meanings (e.g., Jessop, Sparks, Buckland, Harris, & Churchill, 2014; cf. Ehret & Sherman, 2018). One study testing strategies to remedy identity threat found that both a social-belonging intervention and an “affirmation-training” intervention, which encouraged students to incorporate personal values in their daily lives, raised women’s grades in male-dominated engineering fields (Walton et al., 2015). Yet whereas the former increased women’s friendships with male peers, 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 promote friendships with both male peers and women at once, receiving both messages could also be counterproductive. Thus, it may be beneficial to combine approaches, but it is essential to think carefully about how they will interact.

VII. Implications and High Priority Directions for Future Research

We have highlighted the potential of interventions based on social-psychological theory. Yet there is much we do not understand and much to learn, both for theory and for application. Even widely replicated interventions fail in some contexts (e.g., Broda et al., 2018; Dee, 2015; Gerber, Huber, Biggers, & Hendry, 2016) or work for some groups but backfire for others (e.g., Kizilcec et al., 2017; Miyake et al., 2010), sometimes for reasons that are not fully understood (see Miller & Schwarz, 2018). Here we outline some key areas for learning.

Understanding Lasting Change

As discussed earlier, there is considerable evidence that wise interventions produce lasting change by altering recursive processes (Figure 1). How precisely do these processes work? How and when can psychological change interlock with, and alter, a developing social environment? For instance, research shows that teachers can notice the learning-oriented behaviors shown by students following a growth-mindset intervention (Blackwell et al., 2007). Do they then invest more in these students (Rosenthal & Jacobson, 1968), or place them in higher performance tracks (Goyer, Garcia et al., 2017), accelerating gains? Social contexts can also vary in the degree to which a psychological change can take root and persist. The National Study of Learning Mindsets delivered a randomized online growth-mindset intervention to 12,552 9th grade students in 65 nationally representative U.S. public high schools (Yeager, Hanselman, et al., in prep). Although the intervention produced a consistent initial shift in growth-mindset beliefs across schools, its benefits in raising 9th grade achievement were greatest in schools where students were more likely to seek out academic challenges—namely, where peer norms were consistent with the growth-mindset message. Would promoting challenging-seeking norms at the school level enhance the effectiveness of an individual growth-mindset intervention?

It is also important to explore intrapersonal mechanisms of lasting change. Students too may notice initial improvement following a growth-mindset intervention. Does this solidify their newfound belief in the malleability of intelligence? Indeed, people tend to interpret the world in ways that confirm their expectations (Darley & Gross, 1983). They also recruit reasons to support new beliefs so they readily persevere (e.g., even if their original basis has been discredited; Ross, Lepper, & Hubbard, 1975). Could these processes be leveraged to enhance

recursive change?

Research exploring recursive mechanisms should assess not only the psychological processes that issue directly from an intervention, such as beliefs, construals, and identities (see, e.g., Walton & Cohen, 2007, 2011) but also proximate behaviors (see, e.g., Walton & Cohen, 2007; Yeager, Walton, et al., 2016; see Miller, Dannals, & Zlatev, 2017) and developing social relationships (Walton et al., 2015; Yeager, Walton, et al., 2016). There are, of course, pragmatic constraints on assessment. Excessive measures, especially overt ones, can be burdensome, introduce demand, and interfere with intervention effects. It may be necessary to explore processes across multiple studies. Yet understanding the full network of changes that flow from an intervention can inform basic theory about how psychological processes play out in social contexts and show when and how lasting change will occur.

Understanding Social Contexts: How They Vary and How They Change

It is also important to treat the social context as a primary object of analysis. Contexts can vary in the degree to which they inspire maladaptive meanings (e.g., Bugental et al., 2002; Hanselman et al., 2014; Walton et al., 2015), how readily a change in meaning can take root (Yeager, Hanselman, et al., in prep), and their affordances or pathways to success (Dee, 2015; Goyer, Garcia, et al., 2017), and this can determine when and why specific interventions are effective or not (see Table 1). Thus, increasingly the assessment of contexts is a focus of large-scale research. This is an inherently interdisciplinary enterprise that brings social psychologists together with scholars who focus more directly on contexts, such as sociologists, cultural psychologists, and education researchers.

Social contexts can also change—sometimes, rapidly, specifically in response to research activity, and in ways that affect meanings. Indeed, instigating improvement in contexts can be a

primary goal of research (Bryk, Gomez, Grunow, & LeMahieu, 2015). Anticipating and assessing this change is thus important. Earlier we reviewed an intervention that revised the letter a university used to notify students of their placement on academic probation, mitigating stigma and improving recovery a year later (Brady et al., in prep A). Yet because the revised letter led more students to reach out to an advisor promptly after notification, the university altered its policy so that advisors initiated this contact with all students in subsequent cohorts. Although this was a welcome change, it altered the context in which the revised letter had its effect. In subsequent cohorts, all students showed better outcomes than in historical cohorts, and the revised letter did not affect academic recovery. A plausible interpretation is that the research activity improved the social and psychological context in which students were placed on probation and, thus, the local meaning of probation, rendering the specific letter revision less relevant. More broadly, this study illustrates the potential for wise interventions to instigate broad culture change (see Okonofua, Walton et al., 2016; Paluck et al., 2016). Where possible it will be valuable to assess such change systematically, for instance in relevant policies and/or in the attitudes and behaviors of key people who interact with targets of an intervention.

Conscious and Nonconscious Processes

Another high-level question involves the role of conscious and nonconscious processes. Although evidence is sparse, most interventions presumably involve a complex mix of processes. On the one hand, interventions often involve conscious processing of information, such as learning about others' experiences (e.g., social-belonging interventions), learning facts (e.g., growth-mindset interventions), or personal reflections (e.g., value-affirmation). Yet these exercises are designed to help people change meanings of which they may not be fully aware (Nisbett & Wilson, 1977; Wilson, 2002). Consider Pennebaker's (1997) expressive writing

exercise: People choose a personal trauma to write about, a conscious experience. Yet doing so likely stimulates powerful nonconscious meaning-making processes. Similarly, many exercises to change attributions alter behavior even when people cannot directly report on the underlying processes presumably responsible for this change (Nisbett & Wilson, 1977). Participants in social-belonging interventions likely were not fully aware of the link in their minds between experiences of adversity and feelings of nonbelonging, let alone how the intervention changed this. Clearly, the interplay of conscious and nonconscious processes is fertile ground for future research.

The benefits as well as the processes of wise interventions may be opaque to recipients. In part this is because wise interventions work within complex causal systems and aim to help these systems function more effectively; they are not external impositions like a new program or an incentive scheme. A student who benefits from a wise intervention may attribute her success to her hard work and the effective teaching she received, and rightly so. It may be less apparent to her how her learning was also facilitated by a change in her interpretation of schooling (Walton & Cohen, 2011). The intervention simply removed a barrier to allow the person and the system to function optimally. In at least some cases this under-the-radar quality may make wise interventions more effective: It allows recipients to see the ideas conveyed as ones they are freely pursuing, not as imposed upon them (Lyubomirsky et al., 2011; Silverman et al., 2013; Vansteenkiste, Simons, Lens, Sheldon et al., 2004), and to take pride in their accomplishments rather than to cede them to an external influence (see discussion of McCord, 1978 in Ross & Nisbett, 1991).

Adaptation, Scaling, and Social Change

Wise interventions deliberately start small, testing theory-driven hypotheses in specific

contexts with randomized controlled trials. How can these interventions be scaled to new contexts and larger populations? And how can they facilitate broad cultural change? Scaling wise interventions requires: (1) expertise in the meanings targeted and techniques to alter them; (2) expertise in the setting and population at hand, and ways of adapting the intervention as necessary; and (3) effective and reliable means of large-scale delivery. In reviewing these areas, we highlight how effective psychological interventions can promote wide-scale change, and how critical mistakes can reduce an intervention's effectiveness or even cause it to backfire.

1. Psychological expertise. Psychological interventions often involve nuances that, without a deep appreciation of theory, can seem trivial. For example, superficial 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 that they “can do anything” without providing strategies that help them get there. A fundamental goal of basic research is to identify crucial nuances in meanings and ways to promote adaptive meanings effectively—that is, to become psychologically wiser.

Consider a subtle aspect of the intervention that Marigold et al. (2007) used to improve relationships among people with low self-esteem. In the key condition participants were asked, “Explain *why* your partner admired you. Describe what it meant to you and its significance for your relationship.” In another condition, participants were asked, “Explain *whether* you think what your partner said indicated that he/she admired you. Consider whether it was meaningful to you and significant for your relationship” (italicize added). Absent a deep understanding of the nature of self-esteem and its role in relationships, this change may seem trivial. But only the former question improved relationships. Basic research shows why this detail matters: People

with low self-esteem crave love from partners but fear rejection (Murray et al., 2006). Asking *whether* a compliment reflects a partner's love may only heighten those fears. "Explain why," in contrast, assumes this love and invites people to elaborate. Yet it is easy to imagine how a well-intended person could miss this nuance, and inadvertently undermine the benefits (for other key nuances, see Canning & Harackiewicz, 2015; Grant & Hofmann, 2011; Howe et al., 2017).

In some cases, misunderstanding critical nuances can cause harm. In one study, sighted people who took part in an experience that simulated the experience of being blind—which might be thought to increase understanding and empathy—judged blind people as *less* capable of work and living independently, in part because they anticipated they themselves would be less capable and would adapt more slowly (Silverman, Gwinn, & Van Boven, 2015). The simulator led people to experience the trauma of "*becoming* disabled, rather than the competencies and adaptations of *being* disabled" (p. 464; see also Brinkman et al., 2016).

2. Expertise in the setting and population and adaptation of intervention materials.

To deliver an intervention effectively, it is essential to understand the context and the role a meaning does or does not take in it. Earlier we described a study that increased voter turnout by asking citizens the day before two major elections how important it was to "be a voter," rather than how important it was "to vote" (Bryan et al., 2011). The former language represents voting as an opportunity to assume a valued identity. A later study (Gerber et al., 2016) was conducted in low-profile, uncompetitive (many uncontested) Congressional primaries, a context in which being "a voter" does not carry significant identity stakes (see Bryan, Walton, & Dweck, 2016). That study, not surprisingly, found no increase in turnout as a result of noun phrasing (Gerber et al., 2016; see Table 1, Row A; see also Gerber, Huber, & Fang, 2017). Wise interventions may seem simple. However, they are predicated on a deep understanding of specific meanings and

how they arise and function in social contexts.

It is also important to understand how an intervention can be modified appropriately for a new context (e.g., Fisher, Cornman, et al., 2014). For instance, to customize a previously effective growth-mindset intervention for students entering high school (Paunesku et al., 2015), Yeager, Romero, and colleagues (2016) used focus groups and rapid, iterative A/B experiments to address such questions as: (1) Is it better to simplify text using bullet points than paragraphs? (Yes) and (2) Is it better to tell recipients that the exercise is designed to help them or to help future 9th graders? (The latter) As research moves into increasingly different socio-cultural contexts, more substantive revisions may be necessary. Fryberg, Covarrubias, and Burack (2018) describe extensive efforts to adapt research on socio-cultural models of self and growth-mindset for two elementary schools serving predominantly Indigenous children, transforming the school culture and producing striking gains in student learning. It is thus imperative to develop protocols that explicate the assumptions behind intervention materials effective in past contexts and show how they can be revised for new settings (e.g., Bugental, 2017; Walton, Murphy, Logel, Yeager, & CTC, 2017).

Yet interveners cannot anticipate everything, particularly not each recipient's personal context. Recognizing these limits, it is also important to build into intervention exercises opportunities for recipients to customize intervention content themselves in ways that make it maximally relevant and effective for them. For instance, saying-is-believing procedures allow recipients to describe the relevance of a psychological idea to their own lives (see also Canning & Harackiewicz, 2015). It can also be helpful to provide psychological ideas to intermediaries positioned to translate them effectively for others (Outes et al., 2017). Harackiewicz and colleagues (2012) shared information about the usefulness of math and science courses with

parents of high school students, not high school students themselves, increasing students' enrollment in math and science. Knowing their children and school contexts, parents may be best able to help them see the relevance of math and science for their lives.

Misunderstanding how a psychological process works in a context can lead to ironic effects. Earlier we reviewed how an intervention that aimed to instill a sense of control in retirement-home residents could be harmful when the intervention ended, ultimately causing more harm than good (Schulz & Hanusa, 1978). We have also noted the potential iatrogenic effects of value-affirmation interventions among those for whom the adequacy of the self is a reason to stay engaged in a challenge (Kizilcec et al., 2017; Vohs et al., 2012).

3. Effective means of large-scale delivery. Even a well-designed intervention will be ineffective if it does not impart the key meaning with high fidelity. How can we reach large numbers of people effectively? In general, we may expect that when an intervention is delivered in a scalable way to large, diverse samples, it will produce smaller effects than when it is tailored for and hand-delivered to, so to speak, a more homogenous population (see Paunesku et al., 2015; Rodriguez et al., 2015). Yet even small effects can be important when an intervention reaches many people efficiently (e.g., Bond et al., 2012).

Create standardized intervention materials and modules. Although intermediaries can help people see the relevance of an idea, errors can also arise when a complex idea is transmitted from person to person, as in the children's game "operator." Thus, it can be helpful to reach recipients directly with standardized materials. One such means is online reading-and-writing modules. Such modules can be accessed anywhere with an Internet connection; can impart complex ideas using standardized materials; and can incorporate interactive features that enhance engagement and personalization, such as saying-is-believing exercises. This approach has been

used effectively to reach thousands of students with growth-mindset, social-belonging, and related interventions (Kizilcec et al., 2017; Paunesku et al., 2015; Yeager, Romero et al., 2016; Yeager, Walton, et al., 2016). As noted, the National Learning Mindset study delivered an online randomized growth-mindset module to 12,552 9th grade students in 65 nationally representative U.S. public high schools, reducing the likelihood of course failure among lower-achieving students by 6 percentage points (Yeager, Hanselman, et al., in prep). If given in all public schools in the United States, the intervention would be expected to prevent an estimated 95,000 students each year from finishing 9th grade with a D or F GPA. Indeed, once evaluated, such online materials can be disseminated widely at low cost.

Revise ongoing communications. Existing messages distributed to large numbers of people can be infused with wise interventions. Thus, utilities can embed social-norm information (how customers' energy use compares to neighbors') in bills received by millions of people. In one evaluation, this reduced energy use by 2% in nearly 600,000 households (Allcott, 2011), an effect estimated to be about what would arise from a short-term price increase of 11-20%. An implementation-intention intervention embedded in phone scripts used to encourage more than 280,000 citizens to vote raised turnout by 4 percentage points (Nickerson & Rogers, 2010), and a 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 Brady et al., in prep A; Goldstein et al., 2008; Grant & Hofmann, 2011; Hallsworth et al., 2014; Hameiri, Porat, Bar-Tal, & Halperin, 2016; Hammond et al., 2003, 2004; Milkman et al., 2011; Shu et al., 2012).

Intervene through third parties. When one person interacts with many people, altering this person's views and behavior can have broad consequences (Powers et al., 2016). Another means of scaling is to help people influence others for good, promoting broad change. Okonofua,

Paunesku, and Walton (2016) randomized 31 middle-school teachers to an intervention aimed at encouraging an empathic rather than punitive mindset 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 intervention that encouraged them to spread an anti-conflict norm 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%, with the greatest effects in schools in which more of the participating students were influential within the school peer network and thus positioned to alter school norms. Outes and colleagues (2017) had teachers in 799 randomly assigned secondary schools in Peru administer a standardized 1.5-hour growth-mindset curriculum (“Grow Your Mind”). This raised students’ mathematics test scores as compared to 408 control schools, and improved attitudes among both students (e.g., greater expectations of future achievement) and teachers (e.g., greater willingness to encourage students’ learning). And as noted, wise interventions can lead to broad improvements in socio-cultural contexts (Brady et al., in prep A). In these ways, wise interventions can be embedded in social systems to instigate large-scale change.

Proceeding with care. The power of psychological interventions makes them an exciting approach to social problems. Yet this power can be unpredictable. As we have emphasized, poorly understood or poorly implemented interventions can go awry and undermine outcomes (Brinkman et al., 2016; Schulz & Hanusa, 1978; Kizilcec et al., 2017; Silverman et al., 2015; see Lilienfeld, 2007; Wilson, 2011). Common sense is not enough. It is essential to go slowly, and implement the methodological rigor we reviewed earlier: to invest in basic research to understand psychological processes deeply, and in small-scale field studies to examine

malleability and effects over time. As Lewin (1958) wrote, “In social management as in medicine, there are no patent medicines and each case demands careful diagnosis” (p. 211). By becoming psychologically wiser, we can create effective solutions and avoid harm. Indeed, the successes reviewed here all reflect the culmination of many careful, painstaking empirical steps.

VIII. Conclusion

We have described an approach to social and personal change that grows out of basic research in social psychology. By focusing on how people make sense of themselves and social situations, and by changing self-defeating cycles to self-enhancing ones, this approach has produced impressive outcomes, including lasting improvement in academic achievement, lower rates of child abuse, happier marriages, reduced energy use, and better intergroup attitudes. It can seem “magical” when inexpensive and brief exercises produce significant and lasting change (Yeager & Walton, 2011). Yet exercises that seem minor can be transformational to a person for whom that exercise addresses a pressing psychological question, such as whether they belong at school, whether a romantic partner loves them, whether they can get better at math, whether they are a “bad mom,” or whether groups can change in an ongoing conflict.

Psychological change is not simple or easy, and there is much to be learned. Yet an important starting point is understanding that people form working hypotheses about themselves and their environments, often based on reasonable inferences from the world as it presents itself to them; that people strongly desire to see themselves as adequate and as socially connected, and function poorly when they do not; and that altering the inferences people draw can lead them to restructure their lives to lasting benefit. In conceptualizing the person and the situation together, the social-psychological approach can be a powerful way to help people achieve their goals and succeed in their lives.

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