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Social and Emotional Learning: A Principled Science of Human Development in Context

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Decades of research and practice in social and emotional development have left us with a body of knowledge that tells us that (1) social, emotional, and cognitive development are intertwined in the brain and in behavior and influence school and life outcomes; (2) social, emotional, and cognitive skills and competencies grow in supportive relationships and are influenced by experience and context; and (3) there are programs and practices that have been shown to be effective in supporting these skills and competencies. The science of social and emotional learning is distinct in that it represents a blend of the developmental and applied sciences. In this article, we summarize a key framework that has guided much of the research and practical work of social and emotional learning, and we synthesize the major areas of research that have propelled the field forward. We then turn to what's next, describing and illustrating 4 essential principles that should guide work in the future.

The social and emotional learning project is nearing a critical moment. Depending in large part on what policy makers do next, it will either fulfill its potential to create a public good or it will fizzle. (McKown, 2017, p. 1)

This epigraph comes from the Policy Brief associated with the 2017 volume of the journal *The Future of Children* devoted to social and emotional learning (SEL). The sentiment it expresses is accurate today. The past 5 years have seen a veritable explosion in interest and excitement about SEL, and the field *is* on the map. It is on the mind of parents, educators, education leaders and policymakers, child and youth development organizations, education- and health-focused nonprofit organizations, and of course researchers from many disciplines. There are special issues of academic and policy journals devoted to it (like this one; Jones & Doolittle, 2017), education-focused and mainstream journalists are regularly penning pieces about it (e.g., Bornstein, 2015; Brooks, 2016), states across the nation are building SEL standards and benchmarks for pre-K through 12th grade (e.g., Collaborative for Academic, Social, and Emotional Learning, n.d.), there are many varied efforts focused on refining and building approaches to measurement and assessment (e.g., the Assessment Working Group: [https://](https://measuringsel.casel.org/)

measuringsel.casel.org/), and a national commission on the topic wound down its work in early 2019 making recommendations to the nation for the next generation of work in the field (e.g., National Commission on Social, Emotional, and Academic Development, 2019).

But what *keeps* it on the map is not just about what policy makers do next; it is also about what researchers and practitioners do next, and it is fundamentally about how they do the next generation of work together. In this article we summarize a key framework that has guided much of the research and practical work of SEL, and we synthesize the major areas of research, and the key findings, that have propelled the field forward. We then turn to what's next, describing and illustrating four essential principles that in some ways have been implicit guideposts to research and practice in SEL to date. Here we make them explicit and present them as a set of recommendations for how research and practice can work together in a tighter, more transactional dynamic going forward. It is our contention that these core principles are why the field has reached its “critical moment” but also that they are key to future work that will drive it toward its apex.

PREVENTION SCIENCE: A FRAMEWORK THAT DRIVES A FIELD

Prevention Science is a way of thinking—a framework—that guides research and practical work focused on the

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prevention of negative outcomes and the promotion of positive ones. This means the prevention of outcomes across levels, including individual (e.g., problem behaviors, clinical disorders), setting (e.g., classroom- or school-level rates of exclusion, suspension, or expulsion), and organizational (e.g., staff burnout, teacher turnover) outcomes. Likewise, promotion targets include a range of important outcomes (e.g., social and emotional skills and competencies, serve-and-return parenting, college enrollment, emotionally supportive classrooms, the perception of connectedness and belonging in schools, workplace satisfaction, etc.; Coie, Miller-Johnson & Bagwell, 2000; Greenberg & Abenavoli, 2017; Kellam & Langevin, 2003). The notion of prevention has long multidisciplinary roots (Israelashvili & Romano, 2017), but the field as an organized discipline with established tenets emerged more or less in the mid-1970s (e.g., Emory Cowen, 1977) and was largely focused on the work of mental health professionals, clinical practitioners, and researchers who were trying to identify the most effective ways to “prevent or moderate major human dysfunctions” (Coie et al., 1993, p. 1013), including clinical disorders like depression, conduct problems, and serious addictions (e.g., Hawkins, Catalano & Miller, 1992). Since then the field has broadened in its scope, its focus, and its terminology, and we see it in many other sectors, like education (e.g., Aber, Brown, Jones, Berg & Torrente, 2011; Domitrovich et al., 2010).

In practical, and simplified, terms, Prevention Science is fundamentally about linking what we know to what we do and using what we do in the field to grow our knowledge base further. This idea refers to a research-practice interplay that is about (a) effectively translating research and evidence for practical use and (b) building research projects that respond to problems of practice, including the challenges of implementation and sustainability in the real world. These work together in a cycle that both grows knowledge and informs effective practice (Fishbein, Ridenour, Stahl, & Sussman, 2016). The Society for Prevention Research (SPR) describes these components as Type 1 and Type 2 Translational Research (SPR MAPS II Task Force, 2008), which comprise multiple steps in the cycle linking research and practice (Fishbein et al., 2016; Fort, Herr, Shaw, Gutzman, and Starren, 2017). Type 1 refers to “the translation of basic or etiological research into intervention design” (SPR MAPS II Task Force, 2008, p. 2). Type 2 translational research “entails consideration of the entire developmental life cycle of interventions” (SPR MAPS II Task Force, 2008, p. 2), which begins with responding to population needs (i.e., problems of practice as they arise in the world) and addresses factors such as adoption, implementation, and sustainability (SPR MAPS II Task Force, 2008). The SPR position statement on Type 2 translational research states that

“regardless of the point in the intervention developmental life cycle at which the research occurs, the ultimate goal of this type of research is to translate intervention-related scientific discoveries into effective, real world practice” (SPR MAPS II Task Force, 2008, p. 3), and we would add that in so doing, the knowledge base itself becomes richer and more broadly relevant.

Prevention Science is therefore a discipline that brings research and practice together in dynamic interplay in a manner that is bidirectionally translational (Aber et al., 2011; Granger, Tseng & Wilcox, 2014). Research informs practice in that the basic science of human development, developmental psychopathology, cognitive and behavioral neuroscience, public health research, and so on, helps us to understand the variety of risk and protective factors associated with the phenomena we hope to prevent or promote (Kellam & Langevin, 2003). Understanding risk and protective factors and how they vary by individual experience and context provides signals about what prevention initiatives and programs should target (Osher, Cantor, Berg, Steyer & Rose, 2018). It also goes in the other direction from practice to research, meaning that the real world of practice is a source of information about the problems that need addressing but also that the process of studying prevention efforts on the ground feeds back into the knowledge base. Well-designed research tied to the implementation of a prevention initiative provides key information about whether change in the hypothesized targets (i.e., the key risk and protective factors) actually drives change in the outcomes of interest (Schinke, Brounstein, & Gardner, 2003).

A good illustration of this dynamic comes directly from research and practice in SEL. This following example is from the school-randomized longitudinal experimental evaluation of the Reading, Writing, Respect, and Resolution Program (4Rs). The 4Rs is a universal school-based intervention in social-emotional learning. Our evaluation included 18 low-income racially and ethnically diverse New York City public elementary schools, which were matched and randomly assigned to intervention and control conditions. The intervention was implemented across grades K–5 for 3 consecutive years (Jones, Brown, Hoglund, & Aber, 2010). Of interest, the collaborative effort that resulted in the evaluation of 4Rs began about a decade prior in a research–practice partnership between university researchers and a community-based organization called Morningside Center for Teaching Social Responsibility. This partnership started with a joint effort to build a body of knowledge about the programmatic predecessor to the 4Rs, which was called the Resolving Conflict Creatively Program (RCCP; Aber, Brown, Jones & Roderick, 2010). Our groups began the work by co-constructing a common, practice- and theory-based understanding of how various risk factors influence

children's learning and development, what processes might link those risk factors to their trajectories through school and life, how teacher-initiated classroom experiences can redirect trajectories, and what institutional and professional supports and resources were necessary to help teachers engage in the practices necessary for the job. This effort to co-construct a theory of change grounded in practice and designed to guide evaluation work laid the foundation for our research on RCCP (e.g., Aber, Brown & Jones, 2003) and set the stage for program revisions that became the 4Rs.

The theory of change we built together for the 4Rs program is aligned with research and practical work that describes the social-cognitive and interpersonal processes that link individual, family, and community risk factors to the development of aggressive behavior and that place children at higher risk for a broader set of mental, emotional, and behavioral problems (e.g., Coie & Dodge, 1998; O'Connell, Boat, Warner, & The National Research Council and Institute of Medicine, 2009; Aber et al., 2010). One key social-cognitive process directly targeted by the 4Rs is hostile attributional bias, or the tendency to attribute hostile intent to an ambiguous social cue (e.g., Dodge, Bates, & Pettit, 1990). Both theory and basic and applied research suggest that this form of social-cognitive processing is affected by certain types of experiences (e.g., a history of harsh, punitive, or abusive parenting or exposure to community violence; Coie & Dodge, 1998). In turn, attributing hostile intent in social interactions is linked to aggressive behavior (e.g., Dodge, Laird, Lochman, Zelli, & Conduct Problems Prevention Research Group, 2002) as well as to a broader set of mental, emotional, and behavioral problems (e.g., Domitrovich et al., 2010). In the case of 4Rs then, key information from basic and applied research is used to design a preventive intervention to be implemented in schools. The assumption is that when the intervention is tested, we would observe changes in children's tendency to attribute hostile intent in social situations and subsequently in their aggressive and prosocial behavior.

Consistent with the program theory, results indicated statistically significant, positive, moderately sized effects on children's social-cognitive processes (including their tendency to attribute hostile intent in social interactions), problem behaviors, and social-emotional competence (Jones et al., 2010; Jones, Brown, & Aber, 2011). Important to note, change in these outcomes emerged over time, meaning there were few effects after only 1 year of experience with 4Rs, and stronger and more varied effects after 2 years. In addition, the *sequencing* of effects across outcomes over time was notable. We observed changes in social-cognitive processes in the 1st year that were maintained in the 2nd year when we observed

changes in children's aggressive and prosocial behavior (Jones et al., 2011).

These findings overall confirmed the basic research that informed the program theory originally. But we also learned something new that contributes to the knowledge base that can inform program revisions or the design of new interventions. Specifically, we found sizable—up to one half of a standard deviation—impacts on academic outcomes (reading and math) for those children described by their teachers at the outset of the evaluation as having the highest levels of behavioral difficulty (Jones et al., 2011). These findings suggest a next generation of questions about the intersection of universal population-wide effects and those observed for key subgroups (Greenberg & Abenavoli, 2017). For example, do universal school-level population changes in the degree to which children generally attribute hostile intent in social interactions create the conditions in which children with particular problems (i.e., high level of behavioral difficulties—those children about whom hostile attributions are likely being made) have greater learning opportunities (e.g., greater access to the teacher's focused attention)? Would this knowledge shift our approaches to designing reading or other academic interventions? Would this information push us to more directly consider the broader context when designing strategies and practices for classrooms and schools?

Taken together, the collection of findings from 4Rs, coupled with its roots in a research-practice partnership, provide strong evidence for the power of bidirectional translational research in prevention science to inform the design and implementation of prevention initiatives and to build knowledge of human development in context. The work illustrates how a well-functioning relationship between research and practice is iterative and cyclical, embodying close links between knowledge and evidence, strategy, and evaluation. Much of the research in SEL itself is embodied by these types of close links between research and practice and has been, as a field, pushing the frontiers of translational research for decades. In fact, the careful study of several SEL interventions over many years and implementations has made rich contributions to our foundational knowledge and has provided key strategies to the field that are now implemented in a wide variety of schools and systems (e.g., PATHS, Positive Action, RULER, Good Behavior Game; Jones, Barnes, Bailey & Doolittle, 2017). Later in this article we describe the key principles that undergird this body of work and that we hope will guide future work. However, now we turn to a summary of the major areas of research, and key findings, that characterize what we currently know about SEL and its impact on outcomes.

TWO DECADES OF RESEARCH IN SOCIAL AND EMOTIONAL LEARNING

Decades of research and practice in social, emotional, and cognitive development have left us with a foundational body of knowledge that tells us that (a) social, emotional, and cognitive development are deeply intertwined in the brain and in behavior and together influence school and life outcomes including higher education, physical and mental health, economic well-being, and civic engagement; (b) social, emotional, and cognitive skills and competencies grow, and are fostered, in rich and supportive relationships and are influenced by the experiential and contextual landscape of human development; and (c) there exists an array of programs and practices that have been shown to be effective in cultivating and supporting this body of competencies that can be adopted by and implemented in formal and informal learning environments from early childhood through adolescence (Durlak, Domitrovich, Weissberg & Gullotta, 2015; Jones & Kahn, 2017; Jones & Doolittle, 2017). This broad body of knowledge derives from many disciplines; spans qualitative and quantitative research, correlational and longitudinal studies, and quasi- and fully experimental trials; and fundamentally reflects a growing and increasingly robust and rigorous science of human development in context. Next we highlight key studies and their findings that illustrate this body of research.

Correlational Studies

Correlational studies give us a sense of the basic associations among key constructs. For example, research has shown that social and emotional skills are related to positive academic, social, and mental health outcomes (e.g., Moffitt et al., 2011; Greenberg, Domitrovich, Weissberg, & Durlak, 2017). Correlational studies show that classrooms function more effectively and student learning increases when children can focus their attention, manage negative emotions, navigate relationships with peers and adults, and persist in the face of difficulty (e.g., Osher et al., 2016; Jones & Doolittle, 2017). Children who effectively manage their thinking, attention, and behavior are also more likely to have better grades and higher standardized test scores (e.g., Jones, Bailey & Jacob, 2014). Children with strong social skills are more likely to make and sustain friendships, initiate positive relationships with teachers, participate in classroom activities, and be positively engaged in learning (e.g., Denham, 2006). Indeed, social and emotional skills in childhood have been tied to important life outcomes 20 to 30 years later, including having success in the labor market, graduating from high school and succeeding in college, being

healthy, not using substances, and not being involved with the justice system.

Two important studies document these long-term effects. Moffitt et al. (2011) examined the long-term influence of self-control on important life outcomes, including health, wealth, and criminal behavior, independent of social class origin and IQ. Baseline self-control was assessed across a cohort of 1,000 children ranging from 3 to 11 years of age, and follow-up data were collected through 32 years of age. Assessments of health at age 32, including indicators for both physical (e.g., cardiovascular, respiratory, dental) and mental (e.g., depression, substance abuse) health, were associated with self-control in childhood. That is, participants with poor self-control were more likely to experience physical and mental health problems. Self-control also predicted participants' financial situations; children with poorer self-control were less financially planful and were more likely to have financial difficulties such as challenges in money management and the accumulation of credit problems. Self-control was also associated with criminal behavior; children with poor self-control were more likely to have been convicted of a crime than those with higher self-control regardless of social class origin and IQ.

In a study that originated in an evaluation of an SEL intervention (Fast Track PATHS), Jones, Greenberg, and Crowley (2015) tracked the influence of social competence (e.g., cooperation, conflict resolution, perspective taking) in kindergarten on outcomes at age 25 in a sample of more than 700 children from low socioeconomic neighborhoods. Results indicated several statistically significant associations between social competence and life outcomes. For example, children with higher social competence were more likely to graduate from high school on time, complete a college degree, and obtain stable employment. Conversely, children with lower social competence were more likely to be arrested, live in public housing, receive public assistance, and engage in substance abuse.

Although these two studies cannot attribute causal associations between social and emotional skills (e.g., self-control, social competence) in childhood and the outcomes examined, the authors observe these effects after controlling a variety of potential confounding factors including sociodemographic factors, and academic skills and functioning, resulting in a strong case for the salience of SEL skills in childhood for future functioning.

Individual and Multisite Trials of SEL Interventions

Large multiprogram studies and trials of specific interventions in preschool, school, and after-school contexts tell us what works, for whom, and under what conditions. In truth, results from across these different studies are mixed.

For example, we have seen large-scale multisite national studies find small or null effects (e.g., Social and Character Development Research Consortium, 2010), and many individual studies that find important and meaningful effects such as those just described for the 4Rs (Jones et al., 2011). Specific SEL interventions that have been subject to randomized trials, such as the PATHS program, MindUp, RULER, 4Rs, Positive Action, Second Step, and Making Choices (see Jones et al., 2017 for a review focused on elementary school programs), generally show effects in the areas targeted by the intervention. For example, the RULER program broadly targets emotions and its Feelings Word Curriculum focuses on building emotion skills (Rivers, Brackett, Reyes, Elbertson, & Salovey, 2013; see also Brackett et al., this issue), and not surprisingly, the implementation of the program results in changes in children's emotional competencies (Hagelskamp, Brackett, Rivers, & Salovey, 2013). The MindUp program emphasizes self- and physiological regulation and when evaluated showed results in children cognitive and emotional regulatory skills (Schonert-Reichl, Hanson-Peterson, & Hymel, 2015).

In general, SEL programs tend to have their largest effects among students with the greatest number of risks or needs, including those with lower socioeconomic status or those who enter school behind their peers either academically or behaviorally (e.g., Jones et al., 2011). For example, the Good Behavior Game affected aggression only among children who demonstrated low levels of on-task behavior at the outset of the study (Leflot, van Lier, Onghena, & Colpin, 2013). In Making Choices, children who were considered to be at risk of problem behaviors when the study began demonstrated larger gains in social contact and cognitive concentration (Smokowski, Fraser, Day, Galinsky, & Bacallao, 2004). At the school level, it appears that SEL interventions are more effective when school-level factors are optimal, meaning institutions that are more ready to effectively take on and implement an SEL program may see larger overall benefits for students (e.g., Bierman et al., 2010). But within schools, those who struggle the most show the greatest short-term gains (Jones et al., 2017).

Of interest, most studies that include a measure of classroom processes and interactions (e.g., the Classroom Assessment Scoring System) show similar, and substantial, effects on classroom culture and climate (e.g., Brown, Jones, LaRusso, & Aber, 2010; Raver et al., 2008; Rivers et al., 2013; Bierman et al., 2008). Each of these interventions posits a process whereby the intervention influences teacher practices in the classroom, which then influence children's outcomes (e.g., Greenberg et al., 2017; Jones, Brown & Aber, 2008); typically, most studies use the same measure (the CLASS; Pianta, La Paro, & Hamre, 2008). In some cases, that process has been tested

directly. For example, VanderWeele, Hong, Jones, and Brown (2013) showed that intervention-induced changes in classroom processes account in part for the effects of 4Rs on children's outcomes. Similar patterns of effects have been described for other SEL interventions such as INSIGHTS. McCormick, Cappella, O'Connor, and McClowry (2015) reported that the effects of INSIGHTS on reading and math outcomes was partially accounted for by changes in classroom emotional support and organization.

Meta-Analyses

Meta-analyses give us a general sense of the effects generated by interventions by averaging across many studies and organizing outcomes into broad categories. A number of meta-analytic studies published in the past 10 years have demonstrated the significant impact of SEL programming on positive outcomes. For example, in their meta-analysis of 213 school-based universal SEL programs, including data from more than 270,000 students in grades K–12, Durlak, Weissberg, Dymnicki, Taylor, and Schellinger (2011) found that students who participated in evidence-based SEL programs showed significant improvements in SEL skills, behavior, attitudes, and academic performance, as well as fewer conduct problems and lower levels of emotional distress. Important to note, the academic performance of those who participated in SEL programming translated into an 11 percentile-point gain in academic achievement.

Several follow-up studies have sought to examine the longer term benefits of SEL programming. Sklad et al. (2012) reviewed 75 more recent studies of school-based SEL programs and found that there were both immediate- and long-term benefits to participants. Students who participated in SEL programming demonstrated statistically significant follow-up effects across all outcomes, including improved academic achievement and social and emotional skills, as well as reduced antisocial behavior and mental health problems. Another follow-up meta-analysis of 82 studies involving more than 97,000 students revealed that participants continued to demonstrate positive benefits of SEL programs across seven outcome domains for an average of 3.75 years following the intervention (Taylor, Oberle, Durlak, & Weissberg, 2017). Furthermore, on average, these interventions were beneficial across populations, regardless of racial/ethnic or socioeconomic background.

Summary

So, with these two decades of work, what do we have, and what's next? In a general sense, drawing largely from the intervention evaluation work—that which is most

aligned with the core ideas of Prevention Science that have already been described—we have a complex and rich body of knowledge. We have a large federally funded study in which several different “social and character development” interventions were evaluated using (a) a common, cross-site assessment battery and (b) local batteries crafted by individual evaluators to match each intervention’s specific theory of change. Reports of the effects of the seven interventions together using the common cross-site battery described null effects or no differences between the treatment and control groups (Social and Character Development Research Consortium, 2010). Reports of the effects of the interventions generated by some of the individual evaluators showed, in general, positive effects (e.g., Crean & Johnson, 2013; Jones et al., 2011; Lewis et al., 2013), presumably in part because the measures used were closely aligned with what the intervention was designed to impact. In addition, we have a number of large-scale meta-analytic studies that consistently show positive effects of SEL interventions on important developmental outcomes. On balance, it is clear that the field has generated a robust body of evidence that describes, in general terms, what we can expect from SEL interventions. But these studies don’t give us a road map of how to find an SEL intervention or approach that is particularly well suited to specific outcomes (Jones, Brush, et al., 2017).

To meet that need, we have a wide array of studies of individual interventions. In general, these studies report small- to moderate-sized effects on key outcomes. As might be expected, there is a great deal of variation across these studies, with some showing quite consistent effects and others not replicating effects that would be expected (Jones et al., 2017; McClelland, Tominey, Schmitt, & Duncan, 2017; Yeager, 2017). What causes such variation isn’t immediately clear, which can make it hard to interpret and act on the evidence. Does the mixed evidence result from different ways of measuring social and emotional skills? From differences in intervention approaches and variation in implementation? From different ways of designing and executing evaluations of SEL interventions? We note that when theory and measurement are closely aligned we do see significant and meaningful effects, suggesting that the field must be explicit about what we are targeting, about the activities that underlie expected change, and about how we are measuring impact (Jones et al., 2017; Jones, Bailey, Kahn & Barnes, 2019).

In the following section, we focus on what researchers and practitioners do next. We articulate and illustrate four essential principles that, as just noted, have been implicit guideposts to research and practice in SEL to date. The principles are not intended to be exhaustive or definitive and do not necessarily represent new ideas. They are intended instead to serve as a form of checklist—a way to

think about what’s necessary in future work in SEL to ensure that it continues to be applied, impactful, and action oriented.

PRINCIPLES TO GUIDE THE NEXT GENERATION OF RESEARCH AND PRACTICE IN SOCIAL AND EMOTIONAL LEARNING

The four core principles presented here are (a) grounding research in transparent and meaningful theories of change, (b) intentionally designing research activities in close partnership with practitioners so that they are responsive to on-the-ground needs, (c) conducting and communicating research designs and findings with precise terminology that avoids the “jingle-jangle” effect, and (d) building measurement tools that facilitate continuous improvement in teaching and learning.

1. Ground Research in Transparent and Meaningful Theories of Change

Theories of change are critical components of effective SEL research, being foundational to successful program implementation, communication of results, and continuous improvement (Coie et al., 1993; Greenberg, Domitrovich, Graczyk, & Zins, 2005; Luthar, Cicchetti, & Becker, 2000). The sheer complexity of SEL as a construct demands that along with the use of precise terminology and effective measurement tools (see next), SEL researchers ground research and intervention development in transparent and meaningful theories of change. Translating basic research into intervention design, which was described earlier as Type 1 translational research, begins with theory of change. Building theory of change via collaborative research–practice partnerships, as we did with the RCCP and 4Rs, can help educators understand how practice leads to improved outcomes and help researchers go beyond the question of whether a set of practices had an effect to understanding why those practices work and how to improve implementation.

Theory of change (or theory of action, logic models, etc.) is an explicit, and agreed-upon, theory within any given research endeavor about what, how, and why a program, strategy, or intervention will work. In short, a theory of change serves as a map to the core assumptions, specific goals, near and distant outcomes, concrete activities, and mechanisms guiding the work. In this section we present an example of Type I translational SEL research that, by virtue of its grounding in a well-developed theory of change, was able to evaluate program impacts with clarity.

The Chicago School Readiness Project

The Chicago School Readiness Project (CSRP) was a randomized controlled trial of a preschool intervention designed to improve the odds of early school success for children in high-risk neighborhoods (Raver et al., 2008; Watts, Gandhi, Ibrahim, Masucci, & Raver, 2018). The program consisted of two primary intervention activities: (a) Teachers were provided with professional development in classroom management strategies that focus on improving teacher–child relationships and interactions as a tool for supporting children’s behavioral and emotion regulation, both of which were viewed as key pathways to early school readiness, and (b) teachers received ongoing coaching in those strategies from a mental health professional. Important to note, the CSRP theory of change was firmly based in research on the importance of teacher–child relationships, classroom emotional climate, and children’s development of emotion regulation as important drivers of academic readiness (Raver, Garner, & Smith-Donald, 2007; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005). Concretely, the CSRP theory of change specified a sequence of effects that move from intervention itself to the quality of teacher–child relationships, to children’s regulatory skills, and then to children’s behavioral and academic outcomes.

The CSRP theory of change enabled not only a clear rationale for the focus of the program (i.e., supporting teachers to use strategies and tactics of effective behavior management to build higher quality teacher–child interactions and relationships) but also a framework for explicitly examining both whether the program was effective, as well as how and why. Using structural equation modeling, Jones, Bub, and Raver (2013) showed that the effects of the intervention on children’s behavioral and preacademic skills were, in fact, due to changes in the quality of teacher–child relationships and improvements in children’s foundational self-regulatory skills. What’s important here is that the theory of change underlying the intervention was examined explicitly. As with the 4Rs program just described, the CSRP’s well-conceived and explicit theory of change enabled the empirical results from the evaluation of the program not only to inform the implementation and evidence base for CSRP but also more broadly to inform educational practice and developmental science at large.

Type 1 research on SEL will continue to be a priority for researchers. Evaluation of program effects according to established theories of change can improve individual programs, but theories of change must also be carried with researchers as they move from Type 1 to Type 2 research. For those same theories of change to be evaluated effectively, it is important for researchers to work in close partnership with practitioners so that they can

identify critical points of articulation between the theory of change at the program *and* the organizational levels. This brings us to our second core principle of SEL research.

2. Design Research Activities With Practitioners so They Are Responsive to On-the-Ground Needs

The second core principle of SEL research reflects a growing consensus that the study of teaching and learning ought to embrace, rather than resist, the dynamic nature of educational practice (McLaughlin, 1976; Cho, 1998; O’Donnel, 2008). Although the basic tenets of the scientific method advocate for controlled manipulation of key variables and fidelity of program implementation, rarely do the activities of the schoolhouse submit to such regularity. Indeed, the study of organizational behavior has long recognized that “mutual adaptation” between emergent technology and the end user is essential to the successful implementation of new practices (Ard-Barton, 1988). From a mutual adaptation standpoint, the interests of researchers and practitioners are no longer conflicting. Instead, researchers and practitioners develop a shared vision from the beginning and make adjustments as needed, without compromising either the rigor of research or the dynamism of educational practice.

As noted in the review earlier, although SEL has largely developed, especially recently, in the context of carefully controlled interventions (e.g., PATHS: Greenberg, Kusche, Cook, & Quamma, 1995; Second Step: Frey, Hirschstein, & Guzzo, 2000; 4Rs: Jones et al., 2011; CSRP: Raver et al., 2011), the science of human development that informs it has far broader and more flexible applications. For SEL to become fully integrated into educational policy and practice, it is essential that researchers intentionally design research activities in close partnership with practitioners so that they are responsive to on-the-ground needs. This can be a powerful methodological step for researchers to take as they transition from Type 1 to Type 2 translational research. Examples of such researcher–practitioner partnerships are becoming more common in the field of SEL research. We next present one such example as a model.

CASEL’s Collaborating Districts Initiative

Partnerships between researchers and practitioners can take many forms and involve varying degrees of collaboration, but central to an effective partnership is clearly identifying roles, goals, and needs (Coburn & Penuel, 2016; Palinkas, Short, & Wong, 2015). An especially well-developed and intensive form of such a partnership is the Collaborating Districts Initiative (CDI), spearheaded by the Collaborative for Academic, Social and Emotional

Learning (CASEL; Kendziora & Osher, 2016). The CDI is an 8-year intervention implemented across eight large school districts with the aim of promoting system-wide adoption and integration of SEL practice across all levels of the school. Starting in 2010 with three districts, and adding another five districts in 2011, CASEL and the participating districts embraced collaboration in research and practice from the very beginning. That is, whereas the high-level goals on the part of researchers and practitioners were the same, no two districts looked identical in their implementation because research activities were designed with close attention paid to on-the-ground needs.

The CDI practiced mutual adaptation while setting clear expectations to provide a coherent structure for scientific study (Osher et al., 2016). On the part of CASEL, a commitment was made to (a) provide district- and school-level consultation related to SEL practice and policy; (b) develop formal mechanisms to foster communities of learning among participating districts, as well as facilitate access to external SEL service providers and internal CASEL implementation and planning resources; and (c) deliver funding to build capacity and launch SEL practices district-wide. In turn, districts committed to (a) develop a system-wide SEL plan; (b) adopt and implement SEL programming and practices, and integrate SEL supports and professional development services at every level for school and district staff; and (c) continuously monitor and communicate progress, and establish sustainable financial and human capital resources to support SEL implementation.

Two districts in the CDI demonstrate the principles of effective partnership in mutual adaptation particularly well: Cleveland Metropolitan School District (CMSD) and Washoe County School District (WCSD). In each district, researchers were able to answer their primary research questions about effective pathways to district-wide SEL implementation and related social, emotional, and academic outcomes. At the same time, because the research activities were designed in collaboration with districts, CMSD and WCSD were able to pursue pathways to SEL implementation and SEL practices that met their on-the-ground needs.

In Cleveland, a school shooting in 2008 created a crisis for the district and motivated them to address urgent mental health needs and pursue violence prevention strategies (Osher et al., 2016). As a result, CMSD opted for SEL programs based in the violence prevention literature, namely, PATHS (Greenberg et al., 1995) and Second Step (Frey et al., 2000). When CMSD joined the CDI in 2010, they integrated their already-existing violence-prevention and mental health promotion initiative, called Humanware (Faria, Kendziora, Brown, O'Brien, & Osher, 2013), with the research activities of the CDI. Cleveland had already rolled out PATHS to all of its elementary schools by the

beginning of the study and, along with Humanware, was able to scale up its SEL work rapidly.

In contrast to Cleveland's focus on violence prevention and mental health promotion, Washoe County entered the CDI with a focus on improving graduation rates through the use of Early Warning Systems (Balfanz & Byrnes, 2012) and improved school climate (Osher et al., 2015; Owen & Larsen, 2017). Accordingly, their selection of SEL programs differed from those of Cleveland. For grades K–8, WCSD uses the MindUp curriculum (Hawn Foundation, 2008), a program focused on mindfulness practice. For high schools, WCSD uses School Connect (Beland & Douglass, 2006), a program designed to build SEL competencies according to the CASEL model. In addition, because WCSD had already begun implementation of a school climate survey and had strengths in measurement of school outcomes, researchers worked with the district to develop SEL measurement tools, a point we return to later in this article.

Although Cleveland, Washoe County, and the other six CDI districts followed markedly different paths to SEL implementation, clear trends emerged from research (Kendziora & Osher, 2016). First, the authors were able to establish that, with financial support representing 0.04% of the average district's annual budget, SEL implementation at district-wide scale can be achieved and can contribute to modest improvements in SEL competency, behavior, and academic performance. Second, the authors found that the majority of positive school outcomes occurred for districts implementing evidence-based SEL programs, and these benefits took place primarily at the elementary school level. Third, the authors found that the pace of implementation improvement, as well as improvement in school outcomes, was highly variable. Resistance to SEL implementation was most pronounced at the high school level, with concerns from educators about conflicts with the academic curriculum. Many educators also expressed a feeling of "initiative fatigue." One common response that districts found to be an effective antidote to this implementation roadblock was to integrate SEL within existing district-wide initiatives and professional development, making it an explicit part of academic standards.

The steps involved in designing research activities in partnership with practitioners can be demanding and time-consuming, but they arguably result in research that is both more useful for participants and that more closely adheres to principles of ecological validity (Bronfenbrenner, 1979). In the case of the CDI, this has translated into sustainable evidence-based practice for schools and communities and a richer analysis for researchers concerning the many pathways to successful, district-wide SEL implementation (Kendziora & Osher, 2016). Following the second principle of SEL research can maximize the potential for

simultaneously achieving practical, empirical, and theoretical impact; however, this second principle alone is not enough. In order to ensure the broad applicability of SEL research, it is important for researchers to cut through the wide-ranging vocabulary of SEL to achieve clarity in research design and results. This leads to our third core principle.

3. Conduct and Communicate Research Using Precise Terminology That Avoids the “Jingle-Jangle” Fallacy

The third core principle of SEL research addresses the concerns of researchers, and confusion among practitioners, with respect to the wide-ranging terminology used to describe social and emotional learning (National Research Council, 2012; Jones, Zaslow, Darling-Churchill, & Halle, 2016). In part because of the interdisciplinary interest with which SEL has been studied, a profusion of frameworks exists (e.g., 21st-Century Skills, Lifelong Learning Skills, Character Skills) that, very likely, describe a much smaller set of similar and overlapping psychological constructs. First described by Kelly (1927) as the “jangle fallacy,” this phenomenon is not unique to SEL but has plagued educational and psychological research for nearly a century. At the same time, terminology used within SEL sometimes leads researchers and/or practitioners to use a single term (e.g., executive function) when in fact they are referring to distinct underlying constructs (e.g., self-regulation as opposed to working memory, each of which are a component of executive function; Jones, Bailey, Barnes & Partee, 2016). First described by Thorndike (1904), this too is a common stumbling block for researchers and practitioners alike and has presented challenges to educational and psychological research for more than 100 years. Nonetheless, it is all the more important that the jingle-jangle fallacy be addressed as SEL gains greater prominence in research and becomes more commonplace in education. Using precise terminology when conducting and communicating research can help to minimize confusion and maximize the applicability of SEL research and practice across contexts.

Emphasizing precision and transparency will drive our field to develop a better understanding of which skills and competencies are the same, which are different, and which overlap across disciplines, ultimately allowing us to move beyond fads and quick-fix approaches to closer alignment between research and evidence, programs and strategies, and assessment and evaluation. It is important to note that precision does not apply only to constructs and outcomes but is equally relevant to practices and strategies (e.g., what is actually meant by “project-based learning”) and settings (e.g., what is a common and shared definition of “school

climate”). Next we describe an approach to the challenge presented by the jingle-jangle effect and share an example of using precise terminology to achieve broader impact.

The Taxonomy Project

The Taxonomy Project is an initiative that began in our lab with the aim of reviewing the so-called noncognitive skills commonly found in SEL-focused frameworks and identifying areas of overlap and distinction between them (Jones, Bailey, Brush, & Nelson, 2019). This approach acknowledges that a multitude of frameworks and terminology is in use and—without further polarizing their various proponents or adding to the jingle-jangle fallacy by reducing them to a single, new framework—shows researchers and practitioners how to translate across them. The tools generated by the project are designed to organize, describe, and connect frameworks and their terminology across disciplines in a way that is agnostic to brand and sensitive to development and context. In sharing the tools with the field, we hope to increase precision and transparency when communicating about research and practice. At the same time, the tools are designed to allow educators and other practitioners to determine which skills matter to them most and how to go about choosing frameworks, programs, and practices that address them. Choosing well-defined SEL constructs to focus on, in this way, can help focus programs of research and enable continuous improvement within and across contexts. An example of this can be found in another cross-district SEL initiative.

The CORE Districts

The CORE Districts are a network of 10 school districts in California that collaborate with one another to solve common problems and share promising practices (Knudson & Garibaldi, 2015). Among their shared interests, an emphasis on SEL as a means to improve student outcomes led to a carefully chosen set of SEL competencies that guide how they conduct research and communicate their findings across the districts (Marsh et al., 2018). Now in their 8th year, the CORE Districts have developed a research base that, because it was founded on a precise and shared terminology, not only informs their own continuous improvement in SEL but also offers lessons that are readily interpretable for researchers and practitioners in other contexts.

To choose their set of indicators, the CORE Districts first consulted with experts in the field to gain an understanding of the evidence base behind the multitude of SEL indicators they could choose from (Marsh et al., 2018). Important to note, the districts selected only those competencies that they identified as (a) measurable, (b)

malleable, and (c) tied to the broader set of social, emotional, and academic outcomes that are aligned with their intended purposes in implementing SEL practices. The measures they chose include growth mind-set, self-efficacy, self-management, and social awareness. In addition, the districts selected a set of school culture and climate indicators, which they integrated into their assessments of “nonacademic” factors.

Based on their shared definitions, the CORE Districts have conducted analyses of the associations between SEL, school climate and culture, and traditional academic outcomes (Hough, Kalogrides, & Loeb, 2017; West, 2016). This has enabled the districts to identify specific areas for improvement, make informed decisions about where to deploy SEL resources, and set reasonable expectations about improvement. For example, the CORE districts were able to identify significant variance in school average growth in SEL competencies (Loeb et al., 2018); significant variance in the growth of different SEL competencies, on average and by particular sociodemographic profiles (West, Buckley, Krachman, & Bookman, 2018); and that district- and school-level staff varied widely in their understanding of SEL concepts and practice.

The use of clearly defined SEL terminology in developing practice, policy, and measurement goals makes the findings of the CORE districts more immediately actionable for district- and school-level staff. At the same time, their findings are readily interpretable for outside researchers and practitioners interested in making similar investments in SEL. This last point brings us to the fourth principle of SEL research, concerning the development of rigorous measurement tools.

4. Develop Measurement Tools That Facilitate Continuous Improvement in Teaching and Learning

The topic of measurement in SEL has become an increasingly urgent concern among both researchers and practitioners (Berg et al., 2017; Schweig, Baker, Hamilton, & Stecher, 2018; see also McKown this issue). As more schools begin to integrate SEL into their daily work, seeking to reproduce the promising effects found in SEL intervention programs (see Durlak et al., 2011), it is essential that they use measurement systems capable of evaluating such effects. Critical to such systems is a capacity to make causal inferences about change over time in SEL indicators and associated outcomes of interest, such as academic improvement (Berkowitz, Moore, Astor, & Benbenishty, 2017; McCormick et al., 2015). A common approach to SEL measurement involves the use of student surveys, although concerns have been raised about their psychometric properties and their potential for misuse in high-stakes contexts (Duckworth & Yeager, 2015). An

alternative to surveys is direct assessment of SEL competencies, although their use is less well documented. It is key here that we (a) have tools that we are confident adequately capture SEL skills and competencies in ways that are sensitive to age, stage, and context, and (b) are organized around a commitment to using assessment to inform continuous improvement. We present here one example each of survey and direct assessment approaches.

Washoe County School District and CASEL’s Survey of Social-Emotional Competencies

As described earlier in Principle 2, Washoe County School District (WCSD) joined CASEL’s Collaborating Districts Initiative in 2011 (Osher et al., 2016). When WCSD joined the initiative, they had already developed expertise in administering a school climate survey and, with CASEL’s help, they sought to design a measure of SEL for the district as well. CASEL’s framework for social and emotional learning—including the domains of self-awareness, self-management, social awareness, relationship skills, and responsible decision-making—are the domains included in their survey, which align with WCSD’s social and emotional learning standards for grades K–12 (Davidson et al., 2018).

Working together, WCSD and CASEL developed 138 items that measure the five CASEL areas, from which a set of 28 items form the current version of the survey. Using Item Response Theory, WCSD and CASEL validated the survey with a sample of 7,618 students across Grades 5 to 11 for the purposes of evaluating social-emotional competencies. The survey was refined over the course of 2 years and demonstrates a capacity to capture social-emotional competency across a range of approximately -1.8 to 1.41 standard deviations below and above average ability. Questions on the survey are answered on a 4-point scale ranging from *very true* or *easy* to *not at all true* or *difficult*. Example items that follow the stem “How easy or difficult is each of the following for you?” include “sharing what I am feeling with others,” “talking to an adult when I have problems at school,” “respecting a classmate’s opinions during a disagreement,” and “getting along with my teachers” (Davidson et al., 2018, p. 105).

The final version of the survey has been validated and shown to predict important outcomes of interest, including both behavioral and academic outcomes such as standardized reading and math scores, GPA, absences and suspensions (Davidson et al., 2018). CASEL offers the survey free-of-charge, and it has since been adopted by a number of other school districts outside of the CDI (Owen & Larsen, 2017). Again, however, as noted at the outset of this section on measurement, although self-report survey methods, such as CASEL’s, show some promise for

use in SEL research, significant threats to the consistency and validity of their results stem from myriad sources, such as order effects and even the sheer difficulty of the cognitive task involved (Schwarz & Oyserman, 2001). Therefore, researchers would be well advised to exercise caution when interpreting self-report results and, ideally, evaluate such results for convergent validity from additional measurement sources (e.g., third-party observation, performance assessments) and repeated measures.

xSEL Labs' SELweb Online Assessment System

The use of self-report surveys to measure SEL has raised concerns about the interpretability and actionability of results because of well-known effects such as social desirability bias (Crowne & Marlowe, 1960) and concerns that self-reported skill levels may not match up well with actual performance (Shrauger & Osberg, 1981). To address these concerns, and to fill a gap in research left by a relative dearth of performance-based assessments of SEL, McKown, Allen, Russo-Ponsaran, and Johnson (2013) developed a direct assessment of social-emotional competency, called SELweb. Based on the SELF framework (Lipton & Nowicki, 2009), SELweb evaluates student performance on emotion recognition, perspective-taking, social problem-solving, and self-control tasks (McKown, Russo-Ponsaran, Johnson, Russo, & Allen, 2016). Important to note, performance on these tasks reflects a four-factor model of social-emotional comprehension, which the authors describe as a fundamental ability for social and emotional learning. The authors report factor score reliability ranging from $r = .78-.94$ and temporal stability of those factors after a 6-month retest ranging from $r = .52-.71$, which they describe as suitable for the purposes of evaluating student social-emotional competency in school contexts, as well as change over time, at least at the factor level. SELweb further demonstrates both configural and metric invariance across time, gender, and race (McKown, 2019), minimal levels of differential item functioning across gender, and no differential item functioning by race (Dunya, McKown, & Smith, 2018).

Administering SELweb takes approximately 45 min to complete, and it has been validated for use with kindergarten through third-grade students, including a sociodemographically diverse sample of 4,419 students across 20 schools. A recently developed version is now also available for use with fourth through sixth graders; however, a validation study of this version has yet to be published. The first task in SELweb presents children with a series of 40 human faces, each with varying degrees of affective display. Children are required to indicate whether each face demonstrates a "happy, sad, angry, scared, or just okay" emotion. The second task presents children with 12 narrated stories: Six are intended to assess false belief

understanding, and six are intended to assess children's ability to evaluate explicit and implicit desires from varying verbal inflections. The third task presents another 10 illustrated stories that evaluate children's ability to interpret social intentions and provide their own solutions to conflict. Finally, the fourth task includes both a choice-delay task (Kuntsi, Stevenson, Oosterlaan, & Sonuga-Barke, 2001) and a frustration-tolerance task (Bitsakou, Antrop, Wiersema, & Sonuga-Barke, 2006).

Initial results of SELweb have indicated that it has predictive utility similar to the intended uses of SEL surveys. For instance, the test developers have demonstrated SELweb's predictive validity for peer acceptance, teacher-reported social skill, academic achievement, and student problem behaviors (McKown et al., 2013; McKown et al., 2016). The test has also been developed and validated for use with Spanish speakers (Russo, McKown, Russo-Ponsaran, & Allen, 2018). Through xSEL Labs, the test is available online and is currently being used in several districts across the country. As with self-report surveys, however, researchers should exercise caution when interpreting results, especially given the nascent field of SEL performance assessments. Although SELweb has demonstrated encouraging results and is increasingly being used as an outcome measure in ongoing SEL projects, obtaining multiple, convergent sources of measurement evidence for social-emotional skills should be sought in any SEL research endeavor.

In the case of both CASEL's self-report survey and xSEL Labs' SELweb assessment of social-emotional skills, the measurement tool in question was intentionally designed to be put to use in educational settings, meaning they were not solely designed with research and evaluation in mind, but instead were developed to be used by educators. Both have been structured to be used as formative tools, supporting educators to understand the skills and competencies of the students they serve, to make judgments about practices they can use in response, and to reflect on how those practices worked.

CONCLUSION

We have indeed reached a critical moment. There is now a strong and rigorous body of evidence documenting the importance of social, emotional, and cognitive development for an impressive range of positive outcomes including academic achievement, mental and physical well-being, career and financial stability, and civic engagement. We also know that programs and practices can be implemented to effectively build these skills, and we know the conditions under which they are most likely to flourish. Not surprisingly, there is great interest in the field to adopt and implement programs and build and enact SEL

standards. Yet our work is not done. Building on this momentum, we must continue to drive the field forward using the tenets of prevention science and the core principles presented here to grow the practical knowledge-base. In doing so, we—researchers, practitioners, and policy-makers—can work together to develop impactful and feasible solutions that extend the long-term benefits of SEL to all children and across varied contexts.

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