

Appendix A: Descriptions of validation measures

Timothy Allen

Steven Ludeke

Miriam Gensowski

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Appendix A.1: Huebner Life Satisfaction

Instrument: Multidimensional Student Life Satisfaction Scale

Citation:

Huebner, E. S. (1994). Preliminary development and validation of a multidimensional life satisfaction scale for children. *Psychological Assessment*, 6(2), 149.

Use in Previous Research:

- Has been used extensively across cultures (e.g., Gilman et al., 2008; Gilman, Ashby, Sverko, Florell, & Varjas, 2005; Hatami, Motamed, & Ashrafzadeh, 2010; Irmak & Kuruüzüm, 2009), in studies assessing a vast range of constructs including physical and mental health (Sawatzky, Ratner, Johnson, Kopec, & Zumbo, 2009), identity (Pace & Zappulla, 2009), problem behavior (Di Maggio

& Zappulla, 2013), risk and resilience (Veronese, Castiglioni, Barola, & Said, 2012), and social relations (Kim & Kim, 2013), among others.

Constructs Assessed:

• “Specifically, the MSLSS was designed to (a) provide a profile of children’s satisfaction with important, specific domains (e.g., school, family, friends) in their lives; (b) assess their general overall life satisfaction; (c) demonstrate acceptable psychometric properties (e.g., acceptable subscale reliability); (d) reveal a replicable factor structure indicating the meaningfulness of the five dimensions; and (e) be used effectively with children across a wide range of age (grades 3-12) and ability levels (e.g., children with mild developmental disabilities through gifted children).” – MSLSS manual

Comparison to Alternative Measures:

Psychometrics are excellent—see manual for details. There’s evidence of widespread convergent validity among measures of life satisfaction. This measure seems most applicable to a wide age range, as it has been normed in elementary, middle, and high school students. It consists of short, easy to read items (Reading level is 1.5), broken down by contextual setting. Validity and reliability are well-established. Reliabilities all range from .70 to .90 (Huebner, 1994). Factor analyses have confirmed the factor structure of the measure, and various studies have shown excellent convergent and discriminant validity with other developmental assessments. The MSLSS adheres to a multidimensional framework of life satisfaction, which allows more differentiated analyses using various developmental contexts, as compared to other measures that offer only a singular global life satisfaction score.

Appendix A.2: IPIP

Instrument: IPIP Scales

Citation: Maples, J. L., Guan, L., Carter, N. T., & Miller, J. D. (2014). A test of the International Personality Item Pool representation of the Revised NEO Personality Inventory and development of a 120-item IPIP-based measure of the five-factor model. *Psychological Assessment*, 26(4), 1070.

Use in Previous Research:

Various versions of the IPIP (International Personality Item Pool) have been developed to measure the Big Five (e.g., Donnellan, Oswald, Baird, & Lucas, 2006; Goldberg, 1992; Goldberg, 2001; Johnson, 2011; Maples et al., 2014; Saucier & Goldberg, 2002), with considerable overlap in both items and scale content. According to Maples and colleagues (2014), “The chapter introducing the IPIP (Goldberg, 1999) has been cited 1,665 times, items from the IPIP have been used in 581

published studies, 302 scales have been constructed utilizing IPIP items, and the IPIP has been translated into 61 languages” (p. 1071).

IPIP scales have been used in children and adolescents to examine the relationship between personality and a range of biological, cognitive, and social variables including: patterns of cortisol secretion (Hauner et al., 2008), school effort (Galla et al., 2014), academic achievement (Downey, Lomas, Billings, Hansen, & Stough, 2014), peer likeability ratings (Ciarrochi & Heaven, 2009), prosocial behavior and social ostracism (Coyne, Gundersen, Nelson, & Stockdale, 2011), problem gambling (Hanss et al., 2015), steroid use (Sagoe, Andreassen, Molde, Torsheim, & Pallesen, 2015), pregnancy and birth outcomes (Harville, Madkour, & Xie, 2012), compliance to medical treatment (Wheeler, Wagaman, & McCord, 2012), and the stability of psychopathology (Prenoveau et al., 2011).

Constructs Assessed:

The Big Five personality traits and their facets. Research conducted both in the lexical (factor-analyzing words from the dictionary) and questionnaire (factor-analyzing items from existing psychological questionnaires) traditions have consistently derived five broad dimensions that account for the major covariation human personality (Digman, 1990; John, Naumann, & Soto, 2008; Markon, Krueger, & Watson, 2005). These five domains are comprised by an unknown number of facets, which may allow for a more nuanced understanding of how domains are related to outcomes. The five domains, and their facets, assessed here are:

Social Engagement (other labels for this factor include: *Extraversion; Positive Emotionality*): an individual’s preference to actively engage with or approach novelty in their environment.

Individuals high on Social Engagement tend to be dominant, outgoing, expressive, and sociable. In contrast, children who are low on Social Engagement can be characterized as socially inhibited, shy, or withdrawn.

Facets: Friendliness, Gregariousness, Cheerfulness, Excitement-Seeking, Activity Level, Assertiveness

Emotional Stability (other labels for this factor include: *Negative Emotionality, Neuroticism*): reflects an individual’s tendency to experience negative affect, including anxiety, fearfulness, anger, and irritability. Children low in emotional stability tend to be prone to low self-worth, feelings of guilt and shame, and insecurity. High Emotional Stability reflects a child’s propensity for high frustration tolerance, low stress reactivity, and self-confidence.

Facets: Anxiety, Anger, Depression, Self-Consciousness, Immoderation, Vulnerability

Task Performance (other labels for this factor include: *Conscientiousness/Constraint*): reflects tendencies toward voluntary self-control and self-regulation, as well as responsibility, orderliness, planfulness, and achievement motivation. Children low on this trait have been described as impulsive, disorganized, distractible, and careless.

Facets: Self-Efficacy, Orderliness, Dutifulness, Achievement Striving, Self-Discipline, Cautiousness

Collaboration (other labels for this factor include: *Agreeableness*): reflects the tendency to be benevolent, prosocial and empathic toward others, cooperative with peers and family members, and polite. Conversely, children low in Collaboration have been described as antagonistic, rude, and cruel to fellow peers.

Facets: Trust, Morality, Altruism, Cooperation, Modesty, Sympathy

Open-Mindedness (other labels for this factor include: *Openness to Experience; Intellect*): Children high on this trait are typically intelligent, quick and eager to learn, creative, imaginative, and perceptually sensitive.

Facets: Imagination, Artistic Interests, Emotionality, Adventurousness, Intellect, Liberalism

Comparison to Alternative Measures:

IPIP scales have a range of important advantages over other comparable assessments. IPIP scales use items that are brief, but more contextualized than analogous scales using simple descriptive adjectives as items (Goldberg et al., 2006). The IPIP scales we assessed demonstrate excellent convergence with the NEO PI-R, which is the dominant assessment tool for measuring individual differences at the level of resolution required for present purposes (Maples et al., 2014; Goldberg, 2001); we were not able to use the NEO PI-R due to cost considerations for this copyrighted instrument. The IPIP scales we assessed are preferable to more general measures because they assess individual differences at a more fine-grained level than, for example, the level of the Big Five. Research suggests that more narrowly-defined facets can sometimes provide enhanced specificity in predicting important outcomes (Paunonen & Ashton, 2001).

Appendix A.3: Bandura Self-Efficacy

Instrument: Bandura's Children's Self-Efficacy Scale, also referred to as the Multidimensional Scales of Perceived Self-Efficacy

Citation:

Bandura, A. (1990). Multidimensional scales of perceived self-efficacy. Unpublished manuscript.

Use in Previous Research:

- Numerous studies have utilized the Children's Self-Efficacy Scale. One of the seminal papers using the measure looks at the impact of self-efficacy beliefs on academic functioning, and has been cited over 1400 times (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Well-cited studies have used Bandura's scales in examining how self-efficacy is related to gender (Namok Choi, 2004), child and adolescent psychopathology (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999; Muris, 2002), delinquency (Carroll et al., 2009), attachment and peer relations (Coleman, 2002), cultural factors (Ferren, 1999; Huang & Prochner, 2003; Pastorelli et al., 2001), and academic attainment (Caprara et al., 2008; Zimmerman, Bandura, & Martinez-Pons, 1992; Zimmerman & Kitsantas, 2005), among a wide range of other variables.

Constructs Assessed:

- The Children's Self-Efficacy Scale assesses self-efficacy in 9 domains: enlisting social resources, academic achievement, self-regulated learning, leisure-time skills and extracurricular activities, self-regulatory efficacy, self-efficacy to meet others' expectations, social self-efficacy, self-assertive efficacy, and enlisting parental and community support.
- Extensive psychometric research has now been conducted on the Children's Self-Efficacy Scale. Studies show that its factor structure is similar across cultures, though with some minor differences across nationalities (Pastorelli et al., 2001). Choi, Fuqua, and Griffin, 2001 have found that the structure of the measure is largely consistent with the dimensions originally proposed by Bandura, even in undergraduates. Williams and Coombs (1996) further found that while the nine subscales are sufficiently distinct from one another, they nonetheless produce a three factor solution tapping social, academic, and self-regulatory efficacy (the first two of which were used in this context).

Comparison to Alternative Measures:

The Children's Self-Efficacy Scale is one of the dominant measures used to assess perceived self-efficacy in youth. It is well-founded in both empirical and theoretical research. The Children's Self-Efficacy Scale assesses self-efficacy within a variety of relevant developmental contexts, which allows more differentiated analyses, as compared to other measures that offer only a singular global life satisfaction score.

Appendix A.4: Schonert-Reichl MDI

Instrument: Middle Years Development Instrument (MDI)

Citation:

Schonert-Reichl, K. A., et al. (2013). Development and validation of the Middle Years Development Instrument (MDI): Assessing children's well-being and assets across multiple contexts. *Social Indicators Research*, 114(2), 345-369.

Use in Previous Research:

- The MDI is currently gaining in popularity, and has been used mostly in large-scale population-based work. Most studies on this measure evaluate interactive relationships between youth well-being, social and familial support, and broader ecological influences (e.g., SES, schooling, community characteristics).
- For instance, several studies (Guhn et al., 2012, Guhn, Schonert-Reichl, Gadermann, Hymel, & Hertzman, 2013) have used the MDI to examine relations between childhood (N=3,026) well-being and social and contextual assets, relationships with peers and adults, and childhood victimization. Other studies (e.g., Oberle, Schonert-Reichl, & Zumbo, 2011) examined the extent to which perceived family, school, and neighborhood support relate to young people's self-reported emotional well-being.

Constructs Assessed:

“The MDI is designed to be administered as a large-scale, population-level measure so that stakeholders in communities and schools can obtain representative data on children during middle childhood on five dimensions: (1) Social and emotional development, (2) Connectedness to peers and adults at school, at home, and in the neighborhood, (3) School Experiences, (4) Physical health and well-being, and, (5) Constructive use of time after-school” (Schonert-Reichl et al., 2013, pp. 346).

Comparison to Alternative Measures:

- Unlike other measures, the MDI was designed specifically for large-scale population-based research. As of its publication, it was the only instrument designed to collect data on connectedness, social and emotional development physical health and well-being, school experiences, and after school time use, for children during middle childhood.
- Psychometrics are highly comparable to analogous scales, which is to be expected given that many items were drawn from alternative scales (e.g., the Satisfaction with Life Scale for Children). In validation studies, Cronbach's alphas for the MDI scales ranged from .65 to .87, and ordinal alphas from .70 to .91. Validation work has demonstrated excellent model fit for all subscales of the MDI. Correlation patterns between subscales within the MDI domains demonstrate high convergent and discriminant validity of the MDI scales (Schonert-Reichl et al., 2013).

- The MDI was designed specifically as a self-report measure, and both reading level and the developmental appropriateness of content were considered during scale construction. The self-report nature of the measure sets it apart from most other well-being instruments, which are typically either informant-report or appropriate only for older age groups.
- The MDI is “rooted in developmental theory,” and therefore assesses children across multiple contexts and levels of analyses, including the home/school/peer group/community.
- The MDI items were taken primarily from other surveys that were already well-validated and researched with developmental populations. As a result, this instrument provides greater breadth than any one of those single measures, while retaining psychometrically sound, well-validated items and subscales.

Appendix A.5: Crick's CSBS

Instrument: Children's Social Behavior Scale (CSBS)

Citation:

Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development*, 66, 710-722.

Use in Previous Research:

- The CSBS is an immensely popular measure in the developmental literature. The study it debuted in (listed above) has been cited over 3,600 times.
- Uses for the CSBS have been widespread. Some of the more widely cited studies using the measure have looked at the developmental timing and gender differences that are characteristic of relational and overt aggression (Crick, Casas, & Mosher, 1997), the role of aggression in peer relationships (Rys & Bear, 1997), and early moral reasoning about aggressive behavior (Murray-Close, Crick, & Galotti, 2006). Other studies have used the CSBS to examine how aggressive and prosocial behaviors are related to temperament (e.g., Sugimura & Rudolph, 2012), language development (Ostrov & Godleski, 2007), physiological reactivity (e.g., Murray-Close & Crick, 2007; Sijtsema, Shoulberg, & Murray-Close, 2011), and parenting (e.g., Kuppens, Grietens, Onghena, & Michiels, 2009).

Constructs Assessed:

The CSBS includes four subscales to measure relational aggression, overt aggression, isolation, and prosocial behavior. These constructs were selected for inclusion based on their central role in social adjustment research. The overt aggression subscale includes items reflecting physical and verbal aggression. The relational aggression subscale captures behaviors that “represent purposeful attempts to harm, or threats to harm, another’s peer relationships.” The prosocial behavior scale taps helping behavior and empathy. Finally, the isolation subscale taps prevalence of friends and degree of loneliness. Because the prosocial behavior and isolation subscale content is well represented by other validation measures employed in our pilot study (e.g. IPIP Cooperation, Altruism, Sympathy, Friendliness, Gregariousness, and Huebner MSLSS) we included only items from the overt and relational aggression subscales.

Comparison to Alternative Measures:

The CSBS is the dominant measure of these constructs in developmental populations.

Appendix A.6: Derryberry Concentration

Instrument: Attentional Control Scale

Citation: Derryberry, D., & Reed, M. A. (2002). Anxiety-related attentional biases and their regulation by attentional control. *Journal of Abnormal Psychology*, 111, 225-236.

Use in Previous Research:

The initial publication presenting the Attentional Control Scale has been cited over 700 times.

A wide range of studies have examined relationships between the Attentional Control Scale and psychopathology. For instance, Muris, Van Der Pennen, Sigmond, and Mayer (2008) reported that child report of attentional control was moderately to largely correlated with a wide range of pathology (anxiety, depressive, ADHD symptoms), whereas parent reports linked attentional control to ADHD symptoms more specifically. In all cases, higher attentional control was related to less pathology. In the same study, attention control was also linked to increased perceived self-efficacy. Along these same lines, several studies have evaluated whether attentional control interacts with normative personality variables to predict increased risk or resilience to psychopathology, with mixed findings (Meesters, Muris, & van Rooijen, 2007; Muris, de Jong, Engelen, 2004).

Numerous studies have examined the relationship between attentional control and internalizing and externalizing symptoms, both concurrently and prospectively (e.g., Mocan, Stanciu, & Visu-Petra, 2014; Morris, Keane, Calkins, Shanahan, & O'Brien, 2014). Some studies have used the scale within the context of early life adversity paradigms, assessing how attentional control might mediate the relationship between early hardships and later maladaptation (e.g., Crouch et al., 2012). Some studies have also used the attentional control scale as an outcome measure to assess the efficacy of attention training in children diagnosed with ADHD (Tamm, Epstein, Peugh, Nakonezny, & Hughes, 2013). Finally, a few studies have tied the measure's subscales to neurobiological markers using EEG (e.g., Wiersema & Roeyers, 2009).

Constructs Assessed:

The Attentional Control Scale stems from Posner's model of attention (Posner & Peterson, 1990; Posner & Raichle, 1994; Posner & Rothbart, 1998), which views attention as comprised of several systems, specifically a posterior and anterior attentional system. The anterior system serves "as an executive system" that carries out voluntary attention processes (Derryberry & Reed, 2002, pp. 226). Rothbart and colleagues have since proposed that this anterior attentional system underlies the temperament domain of effortful control (Derryberry & Rothbart, 1997).

In adult studies, individual differences in the anterior attentional system have been captured by measures of attentional focusing and attentional shifting (Derryberry & Reed, 2002). In subsequent developmental studies, Derryberry and colleagues combined the attentional focusing and shifting scales to form a measure of Attentional Control.

“Factor analyses indicate that the [Attentional Control] scale measures a general capacity for attentional control, with correlated subfactors related to the abilities (a) to focus attention (e.g., “My concentration is good even if there is music in the room around me”), (b) to shift attention between tasks (e.g., “It is easy for me to read or write while I’m also talking on the phone”), and (c) to flexibly control thought (e.g., “I can become interested in a new topic very quickly when I need to”). The construct of attentional control is more specific than Rothbart’s effortful control in that it includes only attention items, apart from more behavioral forms of inhibition” (Derryberry & Reed, 2002, pp. 226).

Comparison to Alternative Measures:

There are measures other than Attentional Control Scale that are also widely used and well-validated (e.g. the Conners’ ADHD Rating Scales); however, whereas the Attentional Control Scale could be used without permissions, restrictions, or payments, these other measures are copyrighted and often have restrictions on the manner in which they are used. The Attentional Control Scale shows adequate psychometric properties. The total score of the scale is internally consistent in both children and adults with reliability estimates ranging from $\alpha = 0.71$ (Gyurak & Ayduk, 2014; Verwoerd, de Jong, & Wessel, 2006, as cited in Verwoerd, de Jong, & Wessel, 2008) to $\alpha = .88$ (Derryberry & Reed, 2001, cited in Derryberry & Reed, 2002). Reliability estimates of the subscales are $\alpha = 0.70$ for the focusing scale and $\alpha = 0.63$ for the shifting scale with the scales being moderately correlated ($r = 0.41$; Verstraeten, Vasey, Claes, & Bijttebier, 2010). Similar results have been reported in other childhood samples as well (see Muris, de Jong, & Engelen, 2004). As would be expected, the Attentional Control Scale is positively related to indices of positive emotionality such as extraversion ($r = .40$) and inversely related to aspects of negative emotionality such as trait anxiety ($r = -.55$; Derryberry & Reed, 2002). The scale is also modestly correlated with performance based measures of attentional control ($r = .27$; Muris et al., 2008), other self-report measures (e.g., the Persistence/Distractibility scale of the Effortful Control Scale $r = .60$ (Verstraeten et al., 2010). Finally, a major advantage of the Attentional Control Scale is that (unlike some alternative measures) it was not designed specifically for clinical populations. As a result, it may be better suited to capture a wider range of individual differences in attentional control, and therefore may be more applicable to large-scale population-based research.

Appendix A.7: PALS

Instrument: Patterns for Adaptive Learning Survey (PALS): Academic-Related Perceptions, Beliefs, and Strategies

Citation: Midgley, C., Maehr, M. L., Hicks, L., Roeser, R., Urdan, T., Anderman, E., ... & Middleton, M. (2000). Patterns of adaptive learning survey (PALS). Ann Arbor, MI: The University of Michigan.

Use in Previous Research:

The PALS has been cited nearly 400 times, and its manual has been cited over 700 times.

Previous research has examined mastery goal orientation in relation to self-regulated learning strategies (Ablard & Lipschultz, 1998), the stability of goal orientations over time and the influence of perceived parental goal orientations on student goal orientations/student engagement (Gonida, Kiosseoglou, Voulala, 2007; Gonida, Voulala & Kiosseoglou, 2009), classroom disruptive behaviors (Kaplan, Gheen, & Midgley, 2002), classroom social climate (Patrick, Kaplan, & Ryan, 2011), cheating behaviors (Anderman, Griesinger, & Westerfield, 1998), cultural influences on goal orientation (Dekker & Fischer, 2008), academic achievement (Keys, Conley, Duncan, & Domina, 2012), ADHD diagnoses (Barron, Evans, Baranik, Serpell, & Buvinger, 2006), and adaptive and maladaptive forms of perfectionism (Hanchon, 2010).

Constructs Assessed:

Mastery Goal Orientation: The Mastery Goal Orientation scale is a component of the PALS that attempts to measure “students’ reasons or purposes for engaging in academic behavior” (Midgley et al., 1996). Specifically, the Mastery Goal Orientation scale reflects students’ desired to develop and build their competence in an academic achievement setting. When students are oriented to mastery goals, “they seek to extend their mastery and understanding. Learning is perceived as inherently interesting, an end in itself. Attention is focused on the task” (Midgley et al., 1996). Such engagement is indicative of a student who feels able and interested in contributing to classroom activities and assignments, and is in itself a form of academic competence, as high levels of Mastery Goal Orientation predict future learning and academic performance.

Comparison to Alternative Measures:

The PALS is a longstanding, psychometrically sound measure that has a rich history of empirical utility in the field. The PALS were originally developed in the 1990s and have been repeatedly refined and improved since that time. A major advantage of the PALS is that it separates mastery and performance goal orientations, which have been shown to be differentially related to maladaptive and adaptive learning (performance-avoidance orientations associated with maladaptive learning patterns, whereas mastery orientation appears to be linked with adaptive learning; e.g., Ames, 1992; Dweck, 1986; Maehr, 1984; Nicholls, 1984).

Appendix A.8: Big Five Inventory

Instrument: Big Five Inventory for Children (BFI-C)

Citation:

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative big-five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 114-158). New York, NY: Guilford Press.

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory--Versions 4a and 54*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.

Use in Previous Research:

Considerable research has used the BFI to examine the relationship between the five factors and peer relationships in childhood and adolescence. For instance, work by Jensen-Campbell and colleagues (2002; 2014) has linked high Task Performance and Collaboration to peer acceptance, friendship, and decreased peer victimization (Jensen-Campbell & Malcolm, 2007; Jensen-Campbell et al., 2002). Similarly, Gleason, Jensen-Campbell, and Richardson (2004) found that low Collaboration is related to more aggressive behavior in middle childhood, which in turn, predicts worse adjustment. Collaboration has also been shown to be associated with better conflict resolution skills in childhood (Jensen-Campbell, Gleason, Adams, & Malcolm, 2003).

The BFI has also been used to examine the relationship between the Big Five and a diverse array of other important variables including academic achievement, interest, and anxieties, (Freudenthaler, Spinath, & Neubauer, 2008; Freudenthaler, Spinath, & Neubauer, 2010) attitudes toward science (Hong & Lin, 2010), impulsivity (Cumberland-Li, Eisenberg, & Reiser, 2004; Tsukayama, Duckworth, & Kim, 2013), body image in adolescence (Simis, Verhulst, & Koot, 2001), maltreatment and early incarceration (Nederlof, Van der Ham, Dingemans, & Oei, 2010), perceived friendship quality (Poorthuis, Thomaes, Denissen, van Aken, & de Castro, 2012), and externalizing problems (Pursell, Laursen, Rubin, Booth-LaForce, & Rose-Krasnor, 2008).

Constructs Assessed:

The Big Five, described in Appendix A.2. Whereas Appendix A.2. described facet-level measures assessing specific components of each of the Big Five, the BFI is the standard reference for assessing the Big Five themselves in a brief, accessible format.

Comparison to Alternative Measures:

The BFI-C is publicly available through its creator's website (along with other freely available versions of the BFI). Items are brief, but more contextualized than scales using simple descriptive adjectives as items. The scale itself is short (44 items), but it provides excellent coverage of the relevant aspects of each of the five domains. Another advantageous aspect of the BFI-C is that it has

considerable overlap with its parent scale, the BFI (many of the items are actually identical). This point is particularly noteworthy because the BFI is one of the most widely-used and well-validated personality tools in the literature. Indeed, the original BFI publication has been cited over 1700 times, and in fact, many researchers consider the BFI to be the benchmark against which emerging measures of the Big Five should be measured (e.g., DeYoung, Quilty, & Peterson, 2007).

Appendix A.9: Theory of Intelligence

Instrument: Theory of Intelligence / Incremental or Growth Mindset

Citation: Dweck, C. S., Chiu, C.-Y., & Hong, Y.-Y. (1995). Implicit Theories and Their Role in Judgments and Reactions: A World From Two Perspectives. *Psychological Inquiry*, 6(4), 267–285.

or:

Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Psychology Press.

Use in Previous Research:

The target article has been cited about 1050 times, and Carol Dweck's book (2nd citation) about 4580 times.

First, the existence of implicit theories of intelligence (and other beliefs) has been credibly demonstrated, and shown to impact important life outcomes. The beliefs studied are not only about whether intelligence is malleable, but also about the fixed-ness of morality, "kind of person," personality. These beliefs, especially the belief about intelligence, have been shown to influence important life outcomes. Notably, a belief that incremental change or growth in intelligence is possible is very significantly related to educational performance and attainment. Students of all ages who have a "growth mindset" see themselves as capable to change their ability through directed effort, and they associate good school results and progress with effort and practice. Faced with challenging tasks or situations, they tend to increase effort in order to learn or improve. On the other hand, students who think intelligence is fixed tend to shy away from problems where they might fail, and ultimately show less learning and improvement throughout the scholastic career. Students with this implicit "entity theory of personality," who believe that their personal characteristics are fixed, are also more likely to react poorly to social adversities (s.a. exclusion) in the school setting (Yeager and Dweck, 2012).

The implicit theory scales are *complements* to other constructs. For example, a growth mindset is *not* correlated with measures of self-esteem, optimism, and even cognitive abilities (Dweck, Chiu, & Hong, 1995; Levy, STroessner & Dweck, 1998). This means that the theory of intelligence are assumptions or beliefs about the self that have behavioral consequences that are driven by a separate construct than cognitive abilities.

Importantly, interventions have shown that these mindsets are not fixed, but can be influenced by teacher comments, by praise directed at their innate intelligence or at their work ethic, and by direct information provision. For example, 4-6-year old children who were praised for their person exhibited worse coping strategies for set-backs than those who had been praised for their effort or strategy (the process) (Cimpian et al., 2007; Kamins and Dweck, 1999; Mueller and Dweck, 1998). Mindsets have also been shown to matter for adolescents, and how they cope with schooling transitions (Blackwell et al., 2007, studying 7th graders).

Therefore, interventions that foster a growth mindset can influence even stress, health and later achievement as long-term outcomes (Yeager et al., 2014). Mindsets determine how resilient students are to the adversities that naturally arise in the schooling context, and addressing these mindsets can improve academic as well as social outcomes.

Constructs Assessed:

In Blackwell et al. (2007), the Theory of Intelligence of 7th graders is measured with 6 items that are judged on a 6-point Likert scale. Examples are

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