

Measuring School Administrators' Implicit Theories About Teacher Intelligence, Talent, and
Ability: An Implicit Person Theory Teacher Scale (IPT-TS)

A Thesis Presented to
The Faculty of the School of Education
California State University, Channel Islands

In (Partial) Fulfillment
Of the Requirements for the Degree
Masters of Arts

By
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2018

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2018

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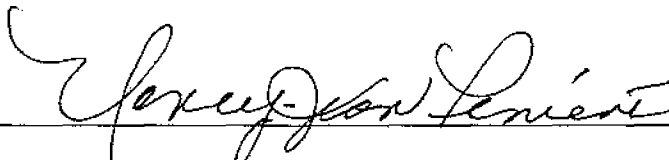
Thesis/Project Title: Measuring School Administrators' Implicit Theories About Teacher Intelligence, Talent, and Ability: An Implicit Person Theory Teacher Scale (IPT-TS)

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Acknowledgements

I will always look back on these two years and think not only of my own efforts and sacrifices, but also those of my husband, whose immense support helped make this endeavor possible. Thank you, Trevor Fisher, for supporting and encouraging me. I am also incredibly thankful for the support of my professor and advisor, W. Charles Weis, Ph.D. for sharing his expertise and for guiding me through this academic journey. His high expectations and constant belief in me made all the difference. I would also like to thank the rest of the faculty within the Educational Leadership P-12 program at California State University Channel Islands for their dedication to molding and guiding educational leaders. Each class has profoundly impacted me as both a person and as an educator. Finally, I am grateful to all of the anonymous school administrators of Ventura County who took the time to take my online survey and participate in this research. I quite literally could not have done this without them.

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Abstract

Implicit Person Theory (IPT), commonly referred to as Growth Mindset Theory, refers to the beliefs that individuals hold about the nature of one's attributes. Some people believe that attributes (such as intelligence, talent, and ability) are fixed, while others believe that those attributes can change and grow over time. Much research has been conducted regarding the implicit person theories (mindsets) of teachers, demonstrating that the implicit theories held by teachers affect how they interact with students and impact students' performance. Studies regarding non-school business supervisors' mindsets toward employees exist, however, none could be found on the implicit person theories (mindsets) of school administrators, toward teachers. This study developed a scale called the Implicit Person Theory Teacher Scale, referred to as the IPT-TS, that validly and reliably measures the implicit person theories of school administrators regarding teachers. The availability of this tool allows research to be conducted to discover how the implicit theories of school administrators affect how they interact with teachers and how those interactions might impact teacher performance.

Keywords: mindset, implicit person theory, growth, fixed, incremental, entity, IPT, scale, school, administrator, teachers.

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Chapter 1: Introduction

Within the domain of psychological research, *self-theories* refers to a group of theories that includes the *growth-mindset theory*. Over several decades, many researchers, particularly Dweck, have written extensively about growth mindset and have demonstrated that individuals hold *implicit person theories* (IPT) regarding the nature of one's attributes. *Entity implicit theory* (commonly called fixed mindset) describes the belief that an individual's attributes (such as intelligence) are fixed and do not change over time. Conversely, *incremental implicit theory* (commonly called growth mindset) describes the belief that an individual's attributes are malleable and can change over time (Dweck, 1999, 2006, 2015; Heslin & VandeWalle, 2008). These potential implicit theories, or mindsets, have many implications regarding one's ability to persevere and persist in the face of obstacles (De Castella & Byrne, 2015; Travers, Morisano, & Locke, 2015), but they also hold implications regarding how individuals act towards and perceive others (Dweck, 1999; Dweck & Leggett, 1988).

Statement of the Problem

Currently, no research could be located on mindsets that school administrators hold or how holding either a fixed or growth mindset could impact the work school administrators do with teachers. Conducting such research poses a challenge, however, because no specific scale exists that is designed specifically to measure the implicit person theories of school administrators regarding teachers. The most commonly used scale to measure implicit person theory is Dweck's Implicit Theories of Intelligence Scale (Dweck, 1999).

This study used the existing scale (Dweck, 1999) as a starting point, and modified it, developing a new scale called the Implicit Person Theory Teacher Scale (IPT-TS) to specifically measure the implicit person theories of school administrators regarding teacher intelligence,

ability, and talent in order to answer the guiding research question: *Can a scale be developed that is valid and reliable to accurately identify the implicit person theories of school administrators regarding teachers?*

Chapter 2: Literature Review

The following literature review presents a summary of research regarding implicit person theory (or growth mindset theory) and outlines how the theory may be applied to multiple attributes and across multiple domains. In addition, research is presented that demonstrates how implicit person theory may be applied to management within a non-school workplace and why a modified version of Dweck's Implicit Theories Scale is necessary to avoid potential Social Desirability Bias (SDB) (Brace, 2008) when measuring the implicit person theories of school administrators and to determine not simply what implicit theories school administrators hold about *people in general* but what implicit theories they hold about *teachers specifically*.

Implicit Person Theory

A complete understanding of this topic necessarily includes literature about implicit person theory, often referred to as growth mindset theory, which provides the theoretical framework for this study. Dweck's foundational research demonstrates how people develop self-theories—beliefs about themselves, others, and the world around them—that then impact how they interact with others and with the world (Chiu, Dweck, Tong, & Fu, 1997; Dweck, 1999, 2006, 2009, 2010, 2015; Dweck, Chiu, & Hong, 1995; Dweck & Leggett, 1988). Dweck's seminal work, *Self-theories: Their role in motivation, personality, and development* (1999), provides a comprehensive overview of self-theories, with particular focus on the concept of implicit incremental theory (growth mindset) versus implicit entity theory (fixed mindset). In it, she describes a number of studies which demonstrate that entity theorists apply their beliefs

about intelligence and other traits not only to themselves, but also to others (Dweck, 1999; Heyman & Dweck, 1998; Hong, Chiu, Dweck, & Sacks, 1997). In addition, entity theorists make quicker judgements (both positive and negative) about a person's character and hold on to those judgements for longer and to a greater degree than do incremental theorists (Chiu et al., 1997; Hong, 1994). Research also shows that one's implicit theories are likely to indicate the type of reaction one will have in response to wrongdoing; incremental theorists are more likely to attempt to educate a wrongdoer and provide an opportunity for change than entity theorists, who are more likely to simply reprimand or report the wrongdoer (Dweck, 1999). For teachers in an educational setting, Dweck posits that those who are not recognized and rewarded for growth may have difficulty creating environments in which students are rewarded for growth (Dweck, 2015). This claim is of particular import, given the growing body of research regarding the impact that implicit person theory and rewards for growth have on children and learning (Dweck, 2014, 2015).

Implicit person theory has been gaining attention in the past few years, both from researchers and from educators eager to apply mindset research to their classrooms (Yettick, 2016). This is because a large amount of the research in this area has focused on children, and particularly school-children in a classroom setting. Research has also been conducted regarding interactions between teachers and students (Dweck, 2014). The application of implicit person theories to education has revealed that students who have a growth mindset regarding intelligence are more likely to exhibit perseverance when faced with obstacles and, ultimately, achieve greater success when facing challenges (Dweck, 1999, 2014; Hochanadel & Finamore, 2015). The ways in which teachers interact with students can impact a student's implicit person theories. In addition, the implicit person theories held by teachers impact how they interact with

students (Dweck, 1999, 2006, 2014). This evidence suggests that school administrators should foster an environment that rewards growth for teachers (Dweck, 2014, 2015), thus encouraging teachers to generate the same environment for the students in their classrooms.

The Role of Implicit Person Theories in Management

In the fields of social and educational research, a significant body of research has emerged regarding the implicit person theories of students and teachers in schools. However, there has been no research regarding the implicit person theories of the individuals in administrative leadership roles within those schools, nor has there been any research on the effect that fixed or growth mindsets held by school administrators could have on the teachers in their employ.

Although the mindsets of public school administrators—the managers of educational workplaces—have not been studied, the mindsets of managers within non-educational workplaces have been studied, to some degree over the past two decades (Heslin, 2003, 2010; Heslin, Latham, & Vandewalle, 2005; Heslin & Vandewalle, 2008, 2011; Heslin, Vandewalle, & Latham, 2006; Keating & Heslin, 2015). A number of research studies have examined the social psychology of managers in light of the implicit person theories that they hold (Heslin, 2003; Heslin et al., 2005; Heslin & Vandewalle, 2008; Heslin et al., 2006). This research provides the necessary bridge to take the bulk of mindset research that has been done with students and teachers and apply it to school administrators and their leadership and management of teachers and personnel.

Heslin conducted a series of studies that investigated the connection between implicit theories about intelligence held by managers and how those managers evaluated and coached employees (Heslin, 2003; Heslin et al., 2005; Heslin & Vandewalle, 2008). These studies

utilized an understanding of organizational effectiveness, acknowledging that effective managers recognize and interact with employees based on the actual performance of those employees rather than any potentially flawed or biased perception of the employees. Given this understanding, the studies examine the implicit theories of managers to determine how implicit theories impact how managers interact with employees.

In the first of a series of four studies (all of which are cited in both Heslin et al., 2005; Heslin & VandeWalle, 2008), Heslin and his colleagues first assessed the implicit theories of nuclear power plant managers and then tested how those implicit beliefs affected how managers assessed employees in a performance review. The researchers correctly predicted that managers who held growth mindsets more accurately recognized improvements in employee performance. A second study (Heslin et al., 2005; Heslin & VandeWalle, 2008) followed that assessed the impact of managers' mindsets on first seeing a good employee evaluation and then seeing a negative employee evaluation. In keeping with Dweck's research (1999), those with growth mindsets were more likely to recognize changes in employee performance, even when the change was negative. A third study (Heslin et al., 2005; Heslin & VandeWalle, 2008) used a longitudinal design to ensure that participants did not realize the connection between the growth mindset surveys they had taken and the employee evaluation results. This study found that managers with fixed mindsets were less likely to change previously held impressions regarding employees. A fourth study (Heslin et al., 2005; Heslin & VandeWalle, 2008) attempted to alter the implicit person theories held by managers through a six-week mindset training course to determine if managers who held a fixed mindset could be taught to adopt a growth mindset instead. The results indicated that managers who participated in the mindset training could obtain a growth mindset.

In a following series of studies (Heslin et al., 2006), researchers found that the extent to which managers coach their employees was positively related to their growth mindset. They also found that managers who begin with fixed mindsets but are trained to adopt a growth mindset demonstrated improved coaching and performance improvement suggestions to employees.

In light of an understanding of organizational effectiveness, the results of all these studies suggest that the most effective managers hold growth mindsets since they are able to adequately recognize change (both growth and decline) in employee performance. The results of these studies have implications for potential employee coaching, as well as for how managers might potentially undergo mindset training in order to change their implicit theory of intelligence from an implicit entity theory (fixed mindset) to an implicit incremental theory (growth mindset). Such training could have positive effects on how managers interact with employees (Heslin et al., 2006).

The studies outlined above expertly tie together management and theories of learning in the context of organizational sciences to tell a story about how implicit beliefs held by managers can affect employees and, as a result, organizational effectiveness. Most significantly, the studies tested the theories of Dweck and her associates to determine if those which have been analyzed extensively in schools and with children extend beyond that scope into non-school workplaces. While this application of implicit person theory to organizational sciences has useful implications for applying implicit person theories to managers in a non-school workplace, a gap currently exists within the research; implicit person theory research has not been extensively studied within *educational* leadership.

Potential for Social Desirability Bias Within Educational Leadership

Researchers who hope to address the gap in the literature regarding the implicit person

theories held by school administrators face a significant barrier to their progress. Currently, the primary research tool used to determine if an individual holds a fixed or growth mindset is the Implicit Theories of Intelligence Scale (Dweck, 1999). However, due to the increase in attention that Dweck's research has received in educational circles (Yettick, 2016), many educators and school administrators are now familiar with the "socially desired" responses to the questions included on the scale. The term Social Desirability Bias (SDB) refers to the phenomenon in which survey respondents provide an inaccurate response in a desire (either conscious or unconscious) to appear other than they are and meet perceived social expectations (Brace, 2008). School administrators are generally well-read and are likely to have been exposed to growth mindset theory and aware of the expected and socially desirable responses to the Implicit Theories of Intelligence Scale (Dweck, 1999). Thus, a new tool for measuring implicit person theory is needed to circumvent potential SDB among school administrators.

Intelligence, Ability, and Talent: Measuring Multiple Attributes and Domains

The term growth mindset has sometimes been used by researchers and educators to refer solely to implicit person theories regarding *intelligence*. However, research indicates that implicit person theory can measure multiple domain-specific attributes, such as intelligence, personality, and morality, and can also measure domain-general implicit person theory (Dweck, 1999; Dweck & Leggett, 1988; Heyman & Dweck, 1998). Individuals can even hold varying levels of entity or incremental beliefs for various attributes, such as intelligence and morality (Dweck et al., 1995). The terms *talent* and *ability* have already been used in implicit person theory research (Chelkowska-Zacharewicz & Kałmuk, 2016; Dweck, 2009), and are useful in the context of this study because they may be less likely to trigger inaccurate responses due to previous exposure and subsequent SDB. Even though *talent* and *ability* are not perfectly

synonymous with *intelligence*, *talent* and *ability* are both attributes that can be used when measuring implicit person theory. Dweck (2009) even specifically uses the terms *talent* and *ability* in a paper on growth mindset in the field of athletics and coaching.

The tool developed in this study—the Implicit Person Theory Teacher Scale (IPT-TS)—uses the terms *talent* and *ability* in addition to *intelligence* in an effort to reduce the potential impact of Social Desirability Bias (SDB) on survey findings from school administrators. This study is predicated on the idea that school administrators who are familiar with the expected growth mindset responses on the Implicit Theories of Intelligence Scale may respond more accurately about teachers when the questions are rephrased. Precedence exists for modifying the focus of scale items in order to provide more specific responses from participants (De Castella & Byrne, 2015; Gero, 2013).

Focus: Self, Others, or Specific Group

As previously mentioned, implicit person theories can be applied to the attributes of the self as well as to the attributes of others (Dweck, 1999; Dweck & Leggett, 1988). In addition to rephrasing the items on the scale to include the words *talent* and *ability*, this study also changes the focus of the items in the tool. Rather than posing statements about the mindsets that one holds about *oneself* or about the mindsets that one holds about *others* in a generic way (using words like “people” or “someone”) the IPT-TS developed in this study specifically focuses on and uses the word *teacher*. Other researchers have similarly changed the language of Dweck’s original tools for the purposes of their research studies. One researcher changed the language in the implicit person theories scale used to include the word *teacher*, but in the context of measuring teachers’ mindsets about their own teaching ability (Gero, 2013). In another case, researchers changed the language of Dweck’s Implicit Theories of Intelligence Scale to include

first-person language (De Castella & Byrne, 2015).

Implicit Person Theory Scale Development

The eight-item Implicit Theories of Intelligence Scale (Dweck, 1999) upon which the IPT-TS is based, grew from a shorter three-item scale with only entity (fixed mindset) items. At that time, researchers argued that only three items were needed because implicit theory is a unitary theme, and also that additional questions would feel repetitious and lead to boredom (Dweck et al., 1995). Over time, however, Dweck and her colleagues added one additional entity item and four incremental items (see Levy, Stroessner, & Dweck, 1998, for a full explanation of the method validation). It is this eight-item version of the scale that has come to be widely used, especially after the publication of Dweck's book in 1999, which contains several scales, including the Implicit Theories of Intelligence Scale. Thus, the IPT-TS uses the eight-item scale as its foundational source.

Summary

In recent years, the research on implicit person theory has gained significant attention, particularly from classroom teachers (Yettick, 2016). As the terminology of growth mindset versus fixed mindset has gained popularity, teachers have begun to discuss mindsets about intelligence with colleagues within their own professional learning communities as well as with their students within the classroom. The research in this literature review summarizes that body of literature and connects it to the new but growing body of work that applies implicit person theory to management within a non-school workplace. The literature presented provides the necessary foundation to explore the application of implicit person theory to the context of management within a school workplace setting. Because no scale currently exists that is designed specifically to measure the implicit person theories of school administrators regarding

teachers, the development of such a scale will create opportunities for future research.

Therefore, this study asks the question: *Can a scale be developed that is valid and reliable to accurately identify the implicit person theories of school administrators regarding teachers?*

Chapter 3: Methods

Research Design

The purpose of this study was to develop a new scale that can measure school administrators' implicit person theories regarding teachers in a valid and reliable way. The hope is that this scale can be used in further research to learn more about what impact the implicit person theories of school administrators has on the work they do with teachers. A quantitative non-experimental, instrument validation design was used in this study to develop the Implicit Person Theory - Teacher Scale (IPT-TS).

Research Hypotheses

Hypothesis 1: Administrators will answer differently on the IPT-TS than on the "Others' Theories of Intelligence Scale – Self Form for Adults" (Dweck, 1999).

Hypothesis 2: Administrators will answer questions about intelligence differently than questions about talent and ability.

Hypothesis 3: Due to Social Desirability Bias (SDB), responses to Dweck's scale will be more positive.

Hypothesis 4: The IPT-TS will have a correlation coefficient similar to or greater than Dweck's scale.

Participants

This study included a convenience sample of 399 school administrators from Ventura

County who had email addresses that were publicly available through the Ventura County Office of Education (VCOE). Ventura County is the 12th largest county in the state of California, and the county demographics are relatively similar to those of the entire state ("U.S. Census Bureau quickfacts: California; Ventura County, California," n.d.). The county is, therefore, a satisfactory representative sample for the state.

Of the 399 school administrators, 130 responses were received; 74 of those responses answered every question and, therefore, are included in this study's analysis. Participants included 27 males, 46 females, and one individual who preferred not to say. Two respondents were in the 25-34 age range, twenty-eight were in the 35-44 age range, twenty-five were in the 45-54 age range, eighteen were in the 55-64 age range, and one was in the 65 and over range. Fifty-two respondents had between 0 and 10 years of experience as a school administrator, and twenty-one had over ten years of experience as a school administrator.

Procedures

Participants were emailed a link to an online survey (see Appendix A for full survey) in February 2018, which was administered via Qualtrics.com, an online survey tool for conducting survey research. A second reminder email was sent out two weeks after the initial email invitation. In all, the survey link was "live" and available for almost a month. Participation in the online survey was voluntary, with the option to terminate responses at any time. In addition, all participation was anonymous, with no way to identify which individuals chose to participate in the survey. All participants gave informed consent at the beginning of the online survey (see Appendix A).

Measures

Participants in the online survey responded to three sets of questions in the following

order: (a) the Implicit Person Theory - Teacher Scale (IPT-TS) developed for this study that is based on the “Others’ Theories of Intelligence Scale – Self Form for Adults” (Dweck, 1999); (b) a set of basic demographic questions to determine if participants were a representative sample; and (c) the original eight-item “Others’ Theories of Intelligence Scale – Self Form for Adults” (Dweck, 1999). The items of the IPT-TS were randomized, while the items on Dweck’s scale were not.

The original eight-item scale developed by Dweck and her associates contains four incremental items and four entity items with 6-point Likert type responses, while the IPT-TS is a 24-item scale with the same 6-point Likert type responses that range from 1 (Strongly Disagree) to 6 (Strongly Agree). See Appendix B for a side-by-side comparison of the items from the two scales.

The IPT-TS scale items use the question stems from Dweck’s scale, with two significant changes. The first change was that, rather than posing statements about the mindsets that one holds about *oneself* or about the mindsets that one holds about *others* in a generic way (using words like “people” or “someone”), the IPT-TS developed in this study specifically focuses on and uses the word *teacher*. Thus, the statement “people have a certain amount of intelligence, and they can’t really do much to change it” (Dweck, 1999) is changed to “*teachers* have a certain amount of intelligence, and they can’t really do much to change it.” The distinction is important because it is possible that school administrators may unconsciously hold different implicit theories regarding teachers than they do other groups of people or people in general. As previously mentioned, precedence exists for modifying the focus of the scale items in order to provide more specific responses from participants (De Castella & Byrne, 2015; Gero, 2013).

The second change to the scale includes the use of the attributes *talent* and *ability* in

addition to *intelligence*. Not only have those attributes been discussed before in other IPT studies (Chełkowska-Zacharewicz & Kalmuk, 2016; Dweck, 2009), but they also describe similar concepts that can be measured by the fixed/growth dichotomy. The main reason for the use of all three attributes, however, is the need to circumvent potentially socially desired responses to scale items. Because school administrators are likely to have been exposed to growth mindset theory, specifically relating to intelligence (Yettick, 2016), using both *talent* and *ability* in addition to *intelligence* on scale items provides participants with additional opportunities to reveal a more accurate revelation of their implicit theories.

Before developing the IPT-TS by making these alterations to the “Others’ Theories of Intelligence Scale – Self Form for Adults” (Dweck, 1999), two attempts to reach Dweck by email were made to solicit approval, but no responses were ever received.

In addition to the IPT-TS items based on Dweck’s question stems, two additional question stems – repeated for each of the three attributes (intelligence, talent, and ability), thus totaling six items – were written specifically for this study and were piloted during the online survey in order to compare them to the commonly used question stems used in Dweck’s survey.

Data Analysis

For both the IPT-TS and Dweck’s scale, both entity and incremental items were included. The incremental items were reverse scored such that for all items, a higher score indicated a stronger incremental belief. Using IBM SPSS, a reliability analysis of item-total statistics revealed that the six piloted scale items not based on Dweck’s question stems reduced internal reliability, and were subsequently removed and not included in the IPT-TS or the analysis of IPT-TS data in this study. A scale analysis was completed for the IPT-TS and Dweck’s scale, and Cronbach’s alpha was calculated to determine the internal consistency of each scale, as the

Cronbach's alpha is most appropriate for determining internal reliability when scale items can be scored with three or more possible values (Huck, 2012), as is the case with the 6-point Likert type items used in this study.

Additionally, after reverse scoring of each of the scales, each participant's responses were averaged to create an overall implicit theory score. Then the overall mean scores of the IPT-TS and Dweck's scale were compared on a frequency graph, which allows visual comparison of the number of mean scores at each level. Likewise, the overall mean scores of the items on intelligence, talent, and ability were also compared. A paired sample t-test for each of these comparisons (between the overall mean scores of the IPT-TS and Dweck's scale and between the overall mean scores of the items on intelligence, talent, and ability) was also run to determine if the differences in mean scores were statistically significant. The paired sample t-test was most appropriate, as the data sets are correlated because they both came from a single group of participants (Huck, 2012).

Principal components factor analysis was not completed to examine construct validity due to the small number of participants in the study ($N = 74$). An N of 200 or greater is the standard for achieving reliable results with factor analysis. An alternative method of confirming construct validity was achieved by running a paired sample t-test between the eight items on Dweck's scale and the eight items from the IPT-TS on teacher intelligence that are most closely aligned with Dweck's question stems.

Chapter 4: Results

Hypothesis 1: Administrators will answer differently on the IPT-TS than on the "Others' Theories of Intelligence Scale – Self Form for Adults" (Dweck, 1999). Analysis reveals that this hypothesis is correct and the difference is statistically significant. Results of a paired samples t-

test of the mean responses to each scale showed that the school administrators in this study ($N = 74$) responded with higher incremental (growth) scores when answering questions specifically about teachers on the IPT-TS (mean = 4.62, $SD = 0.72$) compared to Dweck's scale (mean = 4.24, $SD = 1.08$); $t(73) = 5.31$, $p < 0.001$ (see Table 1). This demonstrates the usefulness of the IPT-TS to illicit more specific responses from participants than the more general questions on Dweck's survey and indicates that school administrators hold somewhat different implicit theories regarding teachers than they do other groups of people or people in general.

Table 2. Cronbach's Alphas and Descriptive Statistics

	N	Cronbach's Alpha	Mean	Std. Deviation
Others' Theories of Intelligence Scale – Self Form for Adults (Dweck, 1999)	74	.930	4.24	1.08
IPT-TS	74	.938	4.62	0.72
IPT-TS, teacher intelligence items	74	--	4.29	1.01
IPT-TS, teacher talent items	74	--	4.88	0.84
IPT-TS, teacher ability items	74	--	4.69	0.72

The mean scores for each participant on both the IPT-TS and Dweck's scale were also distributed onto a frequency graph, visually depicting the difference in responses to the two scales (see Figure 1).

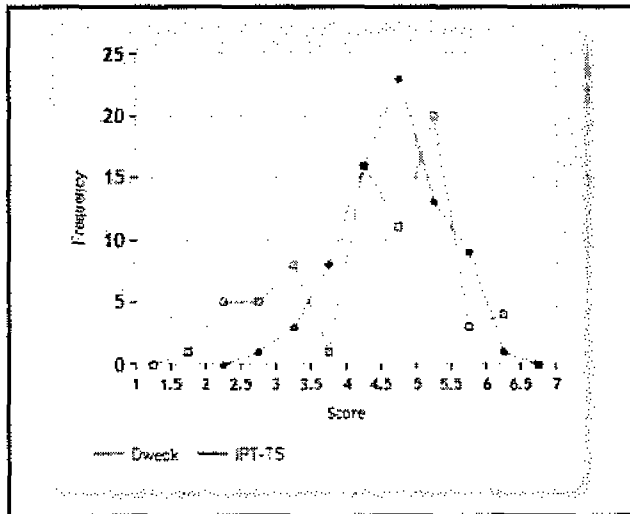


Figure 1. Frequency of mean scores: IPT-TS versus the "Others' Theories of Intelligence Scale - Self Form for Adults" (Dweck 1999). Participant's mean scores to each scale are graphed on a scale with a mean score of 1 reflecting a completely entity "fixed" theory response and a mean score of 6 reflecting a completely incremental "growth" theory response. Note that the graph indicates that there were no responses higher than 6, as such a score was not possible on the given scale.

Hypothesis 2: Administrators will answer questions about intelligence differently than questions about talent and ability. Data reveals that this hypothesis is also correct. There was a statistically significant difference between the way that participants responded to questions about intelligence ($M = 4.29$, $SD = 1.01$) and questions about talent on the IPT-TS ($M = 4.69$, $SD = 0.84$); $t(73) = -3.66$, $p < 0.001$. There was also a statistically significant difference between the way that participants responded to questions about intelligence ($M = 4.29$, $SD = 1.01$) and questions about ability on the IPT-TS ($M = 4.88$, $SD = 0.72$); $t(73) = -6.36$, $p < 0.001$.

These differences in responses are also presented visually in Figure 2, which shows a graph of the frequency of participants' mean responses to the scale items on the IPT-TS. The

graph reveals differences in the frequency distribution of all three attributes.

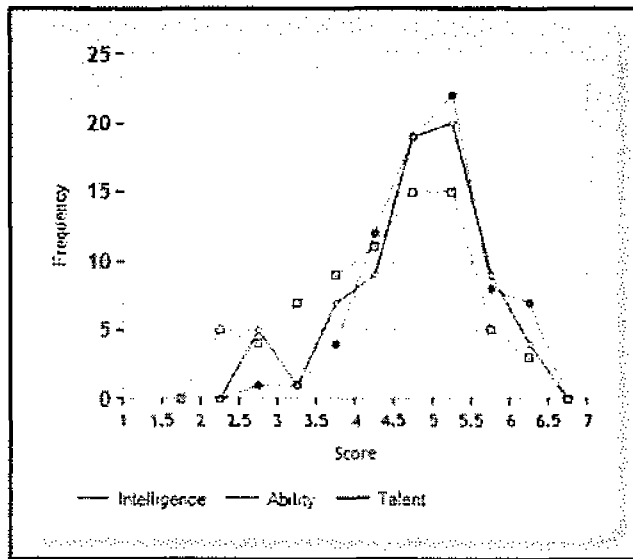


Figure 2. Frequency distribution of participant mean scores regarding teacher intelligence versus teacher talent and ability. Participants' mean scores to each scale are graphed on a scale with a mean score of 1 reflecting a completely entity "fixed" theory response and a mean score of 6 reflecting a completely incremental "growth" theory response. Note that the graph indicates that there were no responses higher than 6, as such a score was not possible on the given scale.

Participants responded with more incremental (growth) responses to questions regarding teacher talent ($M = 4.69$) and teacher ability ($M = 4.88$) than they did to questions about teacher intelligence ($M = 4.29$). This shows that the inclusion of multiple attributes on the IPT-TS does indeed reveal multiple facets of the implicit person theories of school administrators.

Hypothesis 3: Due to Social Desirability Bias (SDB), responses to Dweck's scale will be more positive. This hypothesis was shown to be false. As previously shown in Figure 1 and Table 1, the overall means of participant's implicit theory scores were 4.62 on the IPT-TS and 4.24 on Dweck's scale, revealing that school administrators responded with statistically significant higher incremental scores when answering questions specifically about teachers; $t(73)$

= 5.31, $p < 0.001$.

Hypothesis 4: The IPT-TS will have a correlation coefficient similar to or greater than Dweck's scale. This hypothesis is correct. When calculating Cronbach's alpha, the IPT-TS has a correlation coefficient of .938, which is marginally higher than the correlation coefficient of Dweck's scale, which is .930 (see Table 1).

A paired samples t-test between the eight items on Dweck's scale and the eight items on teacher intelligence from the IPT-TS serves as confirmation that the IPT-TS, with its specific focus on teachers, assesses the same construct as the "Others' Theories of Intelligence Scale – Self Form for Adults" (Dweck, 1999). The t-test revealed that there was no statistical significance between the mean responses to Dweck's scale (which only includes items on intelligence) ($M = 4.24$, $SD = 1.08$) and the teacher intelligence questions on the IPT-TS ($M = 4.28$, $SD = 1.01$); $t(73) = .81$, $p = .418$. This confirms that altering the question stems from focusing on others to focusing on teachers does not affect the construct validity of the scale items. The addition of the attributes talent and ability, along with the change in focus to teachers is what makes the IPT-TS as a whole significantly different from the "Others' Theories of Intelligence Scale – Self Form for Adults" (Dweck, 1999), while maintaining construct validity.

The IPT-TS measured the implicit person theories of school administrators regarding teachers in a valid and reliable way. It maintains the construct validity and internal reliability of Dweck's survey, while also providing more specific results because school administrators answer the more specific IPT-TS questions differently than they do the questions on the Others' Theories of Intelligence Scale – Self Form for Adults (Dweck, 1999).

Chapter 5: Discussion

Ultimately, the answer to this research study's central question – *Can a scale be*

developed that is valid and reliable to accurately identify the implicit person theories of school administrators regarding teachers? – is yes. The scale items are highly correlated, demonstrating that the IPT-TS has internal consistency and is reliable. Not only is the IPT-TS reliable, but it is also a valid scale. A valid scale is one that measures what it says it will measure (Huck, 2012). In the case of the IPT-TS, the scale is valid because it accurately identifies not simply implicit person theories about *people in general*, but implicit person theories about *teachers specifically*, as demonstrated by the statistically significant differences in the way participants responded to Dweck's scale (see Dweck et al., 1995 for a full explanation of that scale's validity and reliability). By altering the focus of the questions from *people* to *teachers* and by adding the additional attributes of *talent* and *ability*, the IPT-TS provides a different perspective on the implicit theories held by school administrators regarding teachers.

The nature of this study does not allow for generating inferences regarding theory or practice; instead, the study developed a tool that may be used to complete studies that would allow one to do so.

Recommendations for Future Research

One of the first recommendations for future research is to replicate the study with a larger sample, both domestically and abroad, and to do so with a greater number of participants so that factor analysis of the results can be completed.

In addition, this study randomized the IPT-TS survey items. Future replications of the study could determine if randomizing the items or presenting them in sections according to attributes may impact the results.

There are many potential avenues for future research using the IPT-TS. For example, studies could examine potential relationships between the IPTs of school administrators and how

those administrators interact with teachers. Researchers could also conduct studies to determine if there are specific behaviors in school administrators that are associated with holding either a “fixed” IPT or a “growth” IPT, and whether or not those behaviors have positive or negative impacts on the schools where they work and the individuals with whom they work. Along those same lines of inquiry, studies could seek to discover if the IPT of a school administrator affects how they coach and evaluate teachers. The results of such studies could have implications in how school districts might make use of the IPT-TS during the hiring process to find and employ more effective administrators, or during training and coaching of current administrators.

Limitations of the Study

One of the limitations of the study was the limited convenience sample that was used because the participants came from the publicly accessible school administrator email addresses available through the county office of education. Another limitation of the study is that the questionnaire taken online by participants was quite long – it contained thirty IPT-TS items, six pilot items, and the eight items from Dweck’s scale, plus demographic questions – and took 10-15 minutes to complete. This may have caused survey fatigue, leading participants to select answers without giving them as much attention or thought as they might have otherwise. As previously mentioned, the questionnaire administered during this study included six pilot questions not based on Dweck’s question stems, but those questions were ultimately not added to the IPT-TS because they reduced the internal reliability of the scale. Since the IPT-TS, as a single questionnaire, has only 24 items, it is anticipated that possible testing fatigue would be minimized.

Conclusion

The compelling body of educational and organizational research regarding implicit

person theory, or growth mindset, is vast and complex. Many implications and facets of growth mindset have been studied, yet no significant research has been completed regarding the mindsets of school administrators. The development of the IPT-TS paves the way to close that gap in the research.

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Appendix A. *Qualtrics Survey*

Implicit Theories of Teacher Talent, Ability, and Intelligence

Start of Block: informed Consent

1.1 Consent Form for Online Questionnaire

You are invited to participate in this online survey on implicit theories regarding teacher talent, ability, and intelligence. This is a Masters Thesis research project being conducted by Christie Fisher, a graduate student at California State University, Channel Islands (CSUCI), under the supervision of Dr. Charles Weis, Assistant Professor of Educational Leadership. It should take approximately 10 minutes to complete.

PARTICIPATION

Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason.

BENEFITS

You will receive no direct benefits from participating in this research study.

RISKS

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

CONFIDENTIALITY

Your survey answers will be sent to qualtrics.com where data will be stored in a password protected electronic format. Qualtrics does not collect identifying information such as your name, email address, or IP address. Therefore, your responses will remain anonymous. No one will be able to identify you or your answers, and no one will know whether or not you participated in the study.

CONTACT

If you have questions at any time about the study or the procedures, you may contact the research supervisor, Dr. Charles Weis via email at charles.weis@csuci.edu. If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honored during the course of this project, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator, you may contact the CSUCI Institutional Review Board at One University Drive, Camarillo, CA or by email at irb@csuci.edu.

ELECTRONIC CONSENT:

Please select your choice below. You may print a copy of this consent form for your records. Clicking on the "Agree" button indicates that:

- You have read the above information
- You voluntarily agree to participate
- You are 18 years of age or older

Agree

Disagree

End of Block: informed Consent

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Start of Block: Main Survey Instructions

2.1

This survey contains questions about implicit theories regarding teacher talent, ability, and intelligence. Completing the survey takes about 10 minutes. Participation is voluntary and you may leave the survey at any time.

There are no right or wrong answers. The researcher is interested in your opinions as a school administrator. Data will be treated confidentially.

During the survey, please think about teachers you have worked with over the years and answer the following questions based on your experiences.

You can click the arrow to begin.

This questionnaire has been developed by Christie Fisher, a graduate student at California State University, Channel Islands and is based on the "Others' Theories of Intelligence Scale – Self Form for Adults" (Dweck, 1999).

End of Block: Main Survey Instructions

Start of Survey Item Survey

3.1 Teachers can learn new things, but they can't really change their basic intelligence.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.2 A teacher's intelligence is something about them that they can't change very much.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.3 Teachers have a certain amount of intelligence, and they can't really do much to change it.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.4 Due to innate intelligence, only some people are excellent teachers.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.5 To be honest, a teacher can't really change how intelligent they are.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.6 Any teacher can significantly change their intelligence level.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.7 Teachers can change even their basic level of intelligence considerably.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.8 No matter how much intelligence a teacher has, they can always change it quite a bit.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.9 No matter what level of intelligence someone has, they can become an excellent teacher.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.10 A teacher can always substantially change how intelligent they are.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.11 Teachers can learn new things, but they can't really change their basic level of ability.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.12 A teacher's ability is something about them that they can't change very much.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.13 Teachers have a certain amount of ability, and they can't really do much to change it.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.14 Due to innate ability, only some people are excellent teachers.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.15 To be honest, a teacher can't really change how much ability they have.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.16 Any teacher can significantly change their level of ability.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.17 Teachers can change even their basic level of ability considerably.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.18 No matter how much ability a teacher has, they can always change it quite a bit.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.19 No matter what level of ability someone has, they can become an excellent teacher.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.20 Teachers can always substantially change how much ability they have.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.21 Teachers can learn new things, but they can't really change their basic level of talent.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.22 A teacher's talent is something about them that they can't change very much.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.23 Teachers have a certain amount of talent, and they can't really do much to change it.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.24 Due to innate talent, only some people are excellent teachers.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.25 To be honest, a teacher can't really change how much talent they have.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.26 Any teacher can significantly change their level of talent.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.27 Teachers can change even their basic level of talent considerably.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.28 No matter how much talent a teacher has, they can always change it quite a bit.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.29 No matter what level of talent someone has, they can become an excellent teacher.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

3.30 Teachers can always substantially change how much talent they have.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

4.1 Please answer the following questions about yourself.

The demographic information provided will not be used to identify participants, but this data will help the researcher better use the following survey information.

4.2 Age:

- Less than 24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 and over
- I prefer not to say

4.3 Gender:

- Male
- Female
- Other Identification
- I prefer not to say

4.4 Ethnicity:

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Pacific Islander
- White
- Other _____

4.5 Number of years as a school administrator:

- 0-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26+
- I prefer not to say

4.6 Number of years teaching before becoming an administrator:

- 0-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26+
- I prefer not to say

4.7 Education Level (check all that apply)

- Administrative Credential
- Master's
- Doctorate

4.8 Current position:

- Elementary Assistant Principal
- Elementary Principal
- Middle School Assistant Principal or Dean
- Middle School Principal
- High School Assistant Principal or Dean
- High School Principal
- Central Office Administrator
- Superintendent or Assistant Superintendent
- Other:

Thank you for participating!

Survey of School Administrators' Implicit Theories of Intelligence

5.1 Almost done! Please respond to these last questions before finishing the survey.

5.2 People have a certain amount of intelligence, and they can't really do much to change it.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.3 Someone's intelligence is something about them that they can't change very much.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.4 No matter who they are, people can significantly change their intelligence level.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.5 To be honest, people can't really change how intelligent they are.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.6 Someone can always substantially change how intelligent they are.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.7 People can learn new things, but they can't really change their basic intelligence.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.8 No matter how much intelligence someone has, they can always change it quite a bit.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

5.9 People can change even their basic intelligence level considerably.

- Strongly Agree
- Agree
- Mostly agree
- Mostly disagree
- Disagree
- Strongly Disagree

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6.1 Thank you for completing this survey! If you have any questions about this research study, please contact the researcher at ChristinaAileen@gmail.com.

Thank you for your participation!

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Appendix B. Side-by-Side Comparison: Others' Theories of Intelligence Scale – Self Form for Adults (Dweck, 1999) and Implicit Person Theory Teacher Scale

ORIGINAL QUESTIONS	IPT-TS: TEACHER INTELLIGENCE	IPT-TS: TEACHER TALENT	IPT-TS: TEACHER ABILITY
People have a certain amount of intelligence, and they can't really do much to change it.*	Teachers have a certain amount of intelligence, and they can't really do much to change it.	Teachers have a certain amount of talent, and they can't really do much to change it.	Teachers have a certain amount of ability, and they can't really do much to change it.
Someone's intelligence is something about them that they can't change very much.*	A teacher's intelligence is something about them that they can't change very much.	A teacher's talent is something about them that they can't change very much.	A teacher's ability is something about them that they can't change very much.
To be honest, people can't really change how intelligent they are.*	To be honest, a teacher can't really change how intelligent they are.	To be honest, a teacher can't really change how much talent they have.	To be honest, a teacher can't really change how much ability they have.
People can learn new things, but they can't really change their basic intelligence.*	Teachers can learn new things, but they can't really change their basic intelligence.	Teachers can learn new things, but they can't really change their basic level of talent.	Teachers can learn new things, but they can't really change their basic level of ability.
No matter who they are, people can significantly change their intelligence level.	Any teacher can significantly change their intelligence level.	Any teacher can significantly change their level of talent.	Any teacher can significantly change their level of ability.
Someone can always substantially change how intelligent they are.	A teacher can always substantially change how intelligent they are.	Teachers can always substantially change how much talent they have.	Teachers can always substantially change how much ability they have.
No matter how much intelligence someone has, they can always change it quite a bit.	No matter how much intelligence a teacher has, they can always change it quite a bit.	No matter how much talent a teacher has, they can always change it quite a bit.	No matter how much ability a teacher has, they can always change it quite a bit.
People can change even their basic intelligence level considerably.	Teachers can change even their basic intelligence level considerably.	Teachers can change even their basic level of talent considerably.	Teachers can change even their basic level of ability considerably.

* According to Dweck, "these items can be used alone" (1999, p. 178).

Table 1. Cronbach's Alphas and Descriptive Statistics

	N	Cronbach's Alpha	Mean	Std. Deviation
Others' Theories of Intelligence Scale – Self Form for Adults (Dweck, 1999)	74	.930	4.24	1.08
IPT-TS	74	.938	4.62	0.72
IPT-TS, teacher intelligence items	74	--	4.29	1.01
IPT-TS, teacher talent items	74	--	4.88	0.84
IPT-TS, teacher ability items	74	--	4.69	0.72