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Mindset Predicting Mindfulness: Developing Professional Capacity

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Abstract

This paper examines the quantitative relationships between mindset and mindfulness in educators and considers how these data might inform strategies used in professional development. Until very recently, mindset and mindfulness were studied only independently of each other even though the theory authors, Dweck and Langer, inhabited similar geographic and temporal spaces. This study, based on 110 educator, self-reported, responses collected over five years, found a statistically significant relationship between a more incremental mindset and higher scores on the Five Factor Mindfulness Questionnaire. Mindfulness was found to predict mindset more strongly than mindset predicts mindfulness. The results of this study, while novel and promising, come with limitations rooted in the nature of self-report measures and the possibility of "false growth mindset". Independent of these limitations, the quantitative results suggest a predictive relationship, not just association, and this could be applied to professional learning, including the deep professional learning associated with educators reflecting on their own identities.

Introduction

The global pandemic has heightened the urgency of increasing educators' professional capacity. Mindfulness and mindset hold promise as means to doing so. Mindfulness means bringing full attention to the present moment in order to participate (Langer, 2014). Mindset describes an individual's set of beliefs and values regarding growth and change (Dweck, 2006).

This study examines the possible quantitative relationship between the mindfulness theory constructed by Langer and mindset theory constructed by Dweck. Thus, a deeper understanding of each concept, its origin and the impact of each in the field of education informs this work.

Langer, a Professor of Psychology at Harvard University, developed a secular theory of mindfulness and defined it as the act of noticing. Langer stated, "mindfulness meant making the decision to notice in each moment new things" (Tippet, 2014) as opposed to a more spiritual conception that requires meditating and other actions associated with mindfulness. Furthermore, upon noticing and seeking to deepen understanding, one questions their thoughts, assumptions and the language used frame and to investigate one's reality. It is important to note that Langer did not negate the mindfulness cultivated through meditation, yoga or other practices, however she felt the ability to become mindful could be experienced more directly without participation in contemplative practice (Powell, 2018; Tippet, 2014). When asked about the relationship between presence and mindfulness, Langer responded, "do we make the decision to be present, or do we make the decision to notice new things that make us present?" (Tippet, 2014).

A contemporary of Langer, Dweck, a Professor of Psychology at Stanford University, developed the theory of mindset. Dweck (2006) defined mindsets as basic beliefs about knowing and learning that guide us. Further, Dweck determined there were sets of beliefs people held that encouraged them to meet their potential and sets of beliefs that prevented them from meeting their potential. When someone believed that their ability to learn and grow was predetermined and no additional effort or opportunity to learn could change this predetermined measurement of potential, Dweck labelled this as a fixed mindset. Conversely, when someone believed that their ability to learn and grow could change with additional effort and opportunity to learn they could change their measured potential, Dweck labelled this as a growth mindset.

According to Dweck (2015), individuals who operate from a fixed mindset before engaging in a task often wonder about the ability and the talent they possess and will it be enough to do well and to maintain their image of being capable and smart. This type of thinking often prevents the individual from participating in the task and diminishes their opportunity to develop their potential to the fullest. Conversely, individuals who operate from a growth or incremental mindset before engaging in a task may wonder about their ability and the talent they possess, but do not concern themselves with whether it is enough to do well, or how to maintain their image of being capable and smart. In fact, individuals operating from a growth mindset believe that they can utilize the ability and talent that they currently possess to further develop and improve their potential (Dweck, 2015). Dweck (2015) further reminds us that no one operates solely from a fixed mindset or a growth mindset, rather we all function using a mixture of both fixed and growth mindsets when engaged in life's lessons.

Both the study of mindfulness and the study of mindset have greatly impacted the field of education. As earlier noted, Langer and Dweck are contemporaries. Both are native New Yorkers; Langer was born in the Bronx in 1946 and Dweck was born in Brooklyn in 1947. Also, Langer and Dweck are both academicians who studied Psychology and earned their Doctoral degrees from Yale University. In 1981, Langer was the first woman in psychology to earn tenure at Harvard University that same year Dweck joined Harvard's Laboratory of Human Development until 1985 then moved on to Illinois University, Columbia University and ultimately Stanford University. Langer and Dweck took similar career paths, it is curious that their research hasn't intersected nor overlapped until very recently. This study seeks to determine what, if any, quantitative connections can be made between mindfulness and mindset, and if

there exists a predictive relationship between the two variables as measured by two self-report instruments.

Beyond the Basics

Research has been conducted to examine the concepts of mindfulness and mindset, and their impact on individuals in a variety of fields e.g., mental health, education, business, etc. Research indicates that mindfulness improves an overall sense of well-being, decreases depression and anxiety (Brown & Ryan, 2004; Kabat-Zinn, 1982, 2003; Kuyken et al., 2013; Langer, 1989, 2014) improves executive functioning (Bishop, Kraemer, et al., 2004; Gallant, 2016) emotional regulation (Hyland, 2016), and memory (Jha et al., 2019; Mrazek et al., 2013). Also, research suggests that a growth mindset improves academic success (Caballero et al., 2019; Yeager et al., 2019), motivation (Bedford, 2017; Dweck, 1996, 2006), cognitive performance (Zenner et al., 2014), and self-efficacy (Samuel & Warner, 2021).

McCaw (2020) describes how mindfulness has moved into the mainstream but stresses that the evidence of the effectiveness of mindfulness in education remains unevenly documented, in part because the term is becoming an umbrella to encompass a broad range of contemplative activities. Similarly, Sellman and Buttarazzi (2020) and Hyland (2016) caution that mindful practices in schools may be losing the key features of spirituality and ethical behavior -- becoming 'McMindfulness'. Researchers call for greater clarity on how schools operationalize mindful practices (Bishop, Lau, et al., 2004; McCaw, 2020; Sellman & Buttarazzi, 2020) while others report on the effectiveness or mindfulness interventions (Flook et al., 2010; Singh et al., 2013; Tobin, 2018). These same articles do not mention mindset. Brown et al (2007b, 2007a) connect mindfulness to reflexive self-consciousness, self-control, and integrative awareness, but again mindset does not appear.

Growth mindset studies, like the studies on mindfulness, include research on efficacy of interventions and associating the construct with other similar concepts. Researchers have documented the efficacy of growth mindset interventions in a myriad of settings (Bedford, 2017; Broda et al., 2018; Rattan et al., 2015; Seaton, 2018; Yeager et al., 2019). Mindset research has explored the connections to motivation (Bedford, 2017; De Castella & Byrne, 2015), resilience (Yeager & Dweck, 2012), reactions to negative events (Dweck et al., 1995), diverse learning theories (Campbell et al., 2020), student disengagement (De Castella & Byrne, 2015), and academic achievement directly (Blackwell et al., 2007; De Castella & Byrne, 2015; Gonida et al., 2006; Schunk, 1995). The pattern of research on mindset appears to resemble that of mindfulness.

The paths of mindset and mindfulness seem to follow a similar course, and only very recently do they intersect. Day and Gregory (2016, 2017) proposed a conceptual relationship between the two theories and Samuel and Warner (2021) merged mindfulness and mindset in a very small scale study designed to reduce math anxiety. They claim that their research "is the first of its kind" (p. 217) and it appears that this might be the case. A much earlier article cites mindset an mindfulness in its title, "Learner Centered Schools as a Mindset, and the Connection With Mindfulness and Multiculturalism" but the term mindset is not describing anything like the incremental or fixed mindset construct developed by Dweck (Thornton & Mcentee, 1995). The other article that may vie for primacy, "Can Mindfulness Help People Implement a Growth Mindset? Two Field Experiments in Hungary" has a November 2020 pre-print date (Orosz et al., 2020). This article includes two studies that are both considerably larger than the Samuel and Warner work, and affirmed the value of integrating mindfulness practices with mindset interventions.

Methods

Previous work hypothesized a connection between mindset and mindfulness (Day & Gregory, 2017) without a quantified connection. This research purports to establish whether a quantifiable connection between these two constructs exists. To this end, the Five Factor Mindfulness Questionnaire (Baer et al., 2008) and the Implicit Theories of Intelligence Scale (Dweck, 1999, 2006) were used via an online survey tool, SelectSurvey. Responses were collected from 2017 to 2021, using a snowball sampling technique. The researchers shared the survey link with educators in their classes and the educators were invited to share the link with other educators in their professional networks. Ultimately, 128 educators participated in this research.

While the faucet-filter model (Day & Gregory, 2017) asserted some relationship between mindset and mindfulness, the direction and strength of association between the two constructs was not established. To address this gap, the following questions framed our research:

1. In educators, Is there a statistically significant correlation between fixed mindset and mindfulness?
2. In educators, Does mindset predict mindfulness?
3. In educators, Does the self-reported amount of prior training in mindful practices predict mindfulness?
4. In educators, Does the self-reported frequency of engaging in mindful practices predict mindfulness?

The process of responding to these four research questions began with describing the sample and determining whether the data met assumptions of parametric techniques. From there, the data

from the sample were assessed to confirm that the scales retained their internal reliability and that the results from the sample were consistent with published reliability data.

Instrumentation

Both the Implicit Theories of Intelligence Scale (Dweck, 2006), the mindset inventory, and the Five Factor Mindfulness Questionnaire (FFMQ; Baer et al., 2006) are valid and reliable tools. Each has a body of literature that demonstrates the validity and reliability of the scale. First, the Implicit Theories of Intelligence Scale, Dweck's mindset inventory, was first validated in a series of six studies that estimated the internal reliability (α) to range from .94 to .98 with a test-retest reliability of .80 (Dweck et al., 1995). Further studies by Levy and Dweck (1998) found the internal reliability to be .93 for the version of the scale we used. Midkiff et al. (2018) used a shorter version of the Implicit Theories of Intelligence Scale and determined the internal reliability to also be .93 for their sample, which is consistent with the earlier studies.

The validity study of the Five Factor Mindfulness Questionnaire included correlations with other mindfulness instruments and exploratory factor analysis (Baer et al., 2006). The internal reliability of the subscales was found to be adequate to good (α = .72-.92) and the five-factor construct's validity was affirmed in a later study (Baer et al., 2008). A more recent study by Bowman (2014) also confirmed the five-factor model and found consistent internal reliability values for the subscales (α = .75-.89).

The results for the current sample align with earlier published studies (Table 1). As in the previous research, the Implicit Theories of Intelligence Scale demonstrated slightly higher internal consistency than the Five Factor Mindfulness Questionnaire. Even with the reliability values of the FFMQ being a bit lower, each of the subscales and the full measures meet the threshold of good to excellent internal reliability.

Table 1

Current study's Cronbach's alpha for the full Implicit Theories of Intelligence Scale (Mindset) and Five Factor Mindfulness Questionnaire and each subscale.

Scale	N of items	alpha
Mindset full	16	.937
Mindset Intelligence	8	.937
Mindset Attribute	8	.894
FFMQ full	39	.918
FFMQ Observing	8	.825
FFMQ Describing	8	.889
FFMQ Acting with Awareness	8	.836
FFMQ Nonjudging	8	.899
FFMQ Nonreactivity	7	.833

Results

The following section includes the results from the study. The five years of data collection elicited a sample that fairly represented the distribution across grade levels but did not match the national statistics of educators in terms of experience. The data were sufficient to run the analyses to test the four research questions. In addition to the aggregate presentation of results, an explicit answers to the research questions are included before the discussion.

Description of the Sample

Over the five years of data collection, 110 educators chose to participate in the research and fully completed both instruments and some of the demographic questions. Eighteen participated in some parts of the survey but not both the mindset and mindfulness surveys so those responses, while retained, were not included in these analyses. While the sample had similar distributions of grade levels taught to the national statistic (Table 2), the sample had

considerably less experience than the national average of 13.8 years (Kaufman et al., 2021). Just over 30% of the sample identified themselves as pre-service educators and over half (59.4%) indicated between zero and twelve years experience at the time they completed the surveys.

Table 2

School level of educators in the sample compared to the national population of educators school level (Kaufman et al., 2021).

		Current Study		National
		n	Percent	Percent
Valid	Elementary (P-5; P-6; K-5; K-6; K-8)	66	51.6	50.4
	Middle (6-8; 7-9; 5-8)	16	12.5	20.1
	High (9-12; 10-12)	21	16.4	29.4
	Total	103	80.5	99.9
Missing		25	19.5	
Total		128	100.0	99.9

Descriptive Results

The results of the two surveys, Dweck's Mindset Inventory (The Implicit Theories of Intelligence Scale) and Baer et al.'s Five Factor Mindfulness Questionnaire (FFMQ), showed relatively consistent groupings of scores on all the subscales based on the standard deviations (Table 3). The mindset subscales used a six-point Likert scale (6=Strongly Agree; 1= Strongly Disagree), with the highest values associated with more fixed mindsets and the lower scores with incremental or growth mindsets. The FFMQ used a five point scale (1=never or very rarely true; 5= very often or always true) with the higher values associated with higher levels of mindfulness.

Table 3

Current study's descriptive results for the full Implicit Theories of Intelligence Scale (Mindset) and Five Factor Mindfulness Questionnaire and each subscale.

Scale	N of responses	Mean	Standard Deviation
Mindset full	125	2.70	.794
Mindset Intelligence	125	2.66	.931
Mindset Attribute	125	2.73	.835
FFMQ full	110	3.31	.465
FFMQ Observing	110	3.46	.665
FFMQ Describing	110	3.47	.713
FFMQ Acting with Awareness	110	3.28	.646
FFMQ Nonjudging	110	3.32	.825
FFMQ Nonreactivity	110	3.01	.641

The midpoint of the mindset scale scores is 3.5 (range of values from 1-6), but the reported scores from this sample were lower than that midpoint indicating a more incremental (growth) mindset. The mean scores were roughly one standard deviation below that middle value with the intelligence subscale being slightly lower (more growth mindset) than the attribute subscale.

The midpoint of the FFMQ subscales and full scale is 3 (range of values from 1-5, the score of 3 is labeled "sometimes true"). All of the subscale means are within one standard deviation of this midpoint suggesting that the respondents' answers were close to the sometimes true response. The mean score of two of the subscales, Observing and Describing, approached the halfway point between sometimes true (3) and often true (4). The highest standard deviation in scores of the FFMQ subscales was the Nonjudging subscale.

Parametric Assumptions

Assumptions required to use parametric tests were satisfied. Specifically, the data were normal (Q-Q plots; Figures 1&2), and the observations were independent of each other. Levene's test showed that the variance was equivalent across all the groups ($F_{(75)} = .849$, $p = .709$). The P-P plot of the regression standardized residual (Figure 3) indicates homoscedasticity.

Figure 1
Q-Q Plot of the Full Mindset Scale Results

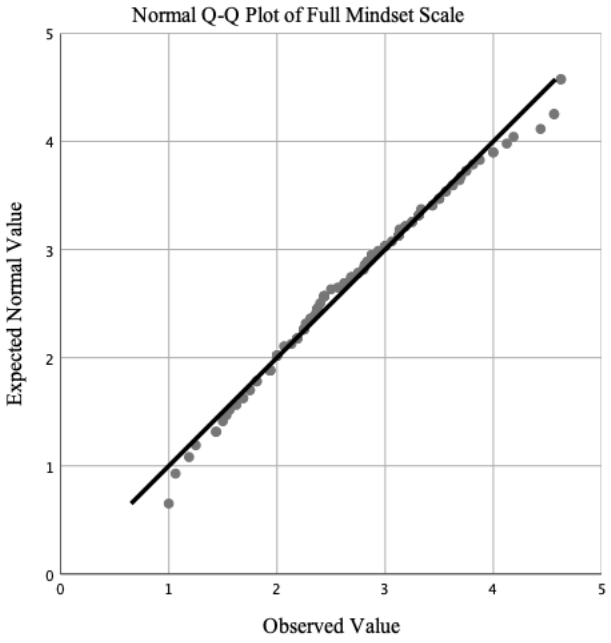


Figure 2
Q-Q Plot of the Full Five Factor Mindset Questionnaire Results

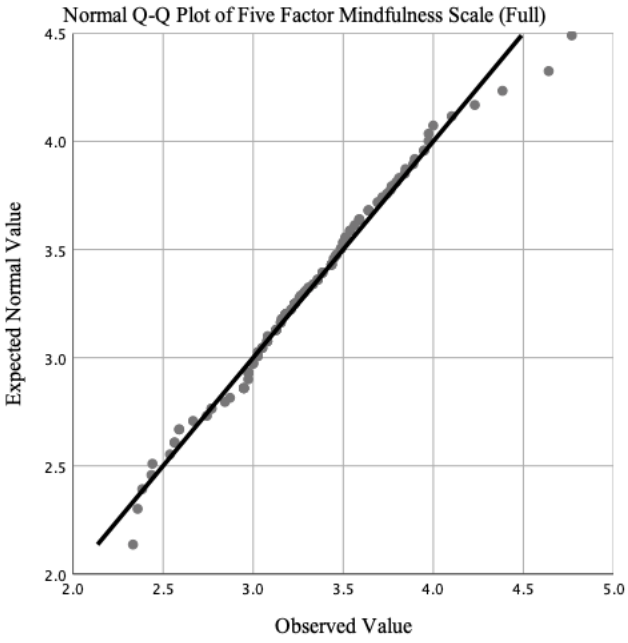
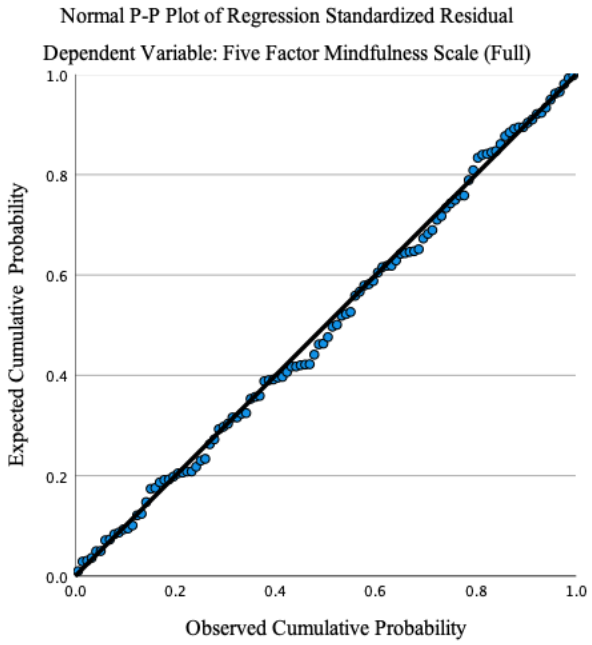


Figure 3
P-P Plot of the Standardized Residuals



Correlations

This study tested the relationship between the respondent's mindset and level of mindfulness. A higher value on the mindset scale (DMI) indicates a more fixed mindset, and so a mathematically negative correlation between mindset and mindfulness was expected. In fact, there is a moderate, statistically significant, negative correlation between fixed mindset and mindfulness in the sample ($r_{(108)} = -.21, p = .025$). Within the mindset subscales (intelligence and attribute) the correlation with mindset was consistently negative, but only the attribute subscale was significantly related to mindset ($r_{(108)} = -.25, p = .009$).

The five factors of mindfulness (observing, describing, acting with awareness, nonjudging, and nonreactivity) were also tested against the full mindset scale but only the acting with awareness subscale demonstrated a statistically significant relationship ($r_{(108)} = -.27, p =$

.005). The other four subscales exhibited very slightly negative associations (observing, -.13; describing, -.16; nonjudging, -.04; and nonreactivity, -.14), none of which were significant.

Demographic variables were also evaluated to see if they had any associations with the scores on the two measures, but none were found.

Regression

Based on the literature, a few models were tested on the data. In the first series of tests, all models included the full mindset scale as a possible predictor of mindfulness. Other variables tested included the frequency of engaging in mindfulness, prior mindfulness training, grade level taught, site description, and years of experience. Regression shows that mindset (DMI) predicts mindfulness on the FFMQ (b = -.12, $t_{(106)}$ = -2.05, p = .043), but prior training (b = .02, $t_{(106)}$ = -1.11, p = .269) and frequency of engaging in mindfulness (b = .03, $t_{(106)}$ = .642, p = .522) do not.

After the initial series of analyses, the mindfulness scale (FFMQ) was tested as a predictor of mindset to see whether one was a stronger predictor of the other. In fact, mindfulness predicts mindset more strongly than mindset predicts mindfulness (b = -.356, $t_{(108)}$ = -2.72, p = .025; r^2 = .046, $F_{(1, 108)}$ = 5.16, p = .025).

Answers to the Research Questions

1. There is a moderate, statistically significant, negative correlation between fixed mindset and mindfulness in the sample ($r_{(108)}$ = -.21, p = .025).

   1a. FFMQ predicts Mindset (b = -.356, $t_{(108)}$ = -2.72, p = .025; r^2 = .046, $F_{(1, 108)}$ = 5.16, p = .025.)

2-4. Regression shows that mindset (DMI) predicts mindfulness on the FFMQ (b = -.12, $t_{(106)}$ = -2.05, p = .043), but prior training (b = .02, $t_{(106)}$ = -1.11, p = .269) and frequency of engaging in mindfulness (b = .03, $t_{(106)}$ = .642, p = .522) do not.

Discussion

While the constructs of mindfulness and mindset have been extensively researched independently, until very recently they had not been studied together (Day & Gregory, 2017; Orosz et al., 2020; Samuel & Warner, 2021). The moderate negative correlations found in this study between mindset and mindfulness make sense. The expected, negative correlation between fixed mindset and mindfulness shows that a greater the leaning towards growth mindset is associated with higher scores on the mindfulness inventory. Within the subscales of the FFMQ and DMI there were additional associations, most notably that the intelligence subscales were not correlated with mindfulness but the attribute subscale of the DMI did show some correlations.

Perhaps the lack of correlation of the intelligence subscale can be explained by the social desirability of holding growth mindset beliefs about student intelligence. The attribute subscale of the DMI demonstrated a moderate, negative correlation ($r_{(108)} = -.25, p = .009$) which is a stronger correlation than the full scale. The mean score of the attribute subscale was higher than the mean score on the intelligence subscale indicating that the respondents reported more growth mindsets regarding intelligence than they did other attributes. The standard deviation of the intelligence subscale of the DMI also showed a higher variation in responses, suggesting that respondents were more varied in how they responded to the items within this subscale.

Interestingly, the tested demographic variables (educator's role, school setting, years of experience, age, prior mindfulness training and frequency of engaging in mindfulness activities) did not demonstrate any relationships with the mindset (DMI) or mindfulness (FFMQ) measures. These demographic variables were also not significant predictors or either mindset or mindfulness. The absence of significance in the prior training and frequency of engagement variables predicting higher scores on the FFMQ may be a result of the way these questions were

worded, or the recent increase in workplace-based workshops and training on mindful practices. In other words, some respondents have engaged in training and participate (or even led) mindful practices at work who may not have chosen to do so had there not been an initiative at the school in which they work.

The lack of significant findings on the tested demographic variables holds promise for educational leaders seeking to develop the professional capacities of their faculty and staff. Differentiating professional learning based on demographic variables could be problematic in terms of equitable opportunities. These results also suggest that promoting secular mindfulness practices may offer greater returns on limited professional learning resources than time and money spent on direct mindset work as explicit training on growth mindset may encourage edcuators to claim a growth mindset regardless of actual beliefs due to social desirability.

While pervious mindfulness practice was among the tested variables that did not demonstrate statistical significance, the results of this study may have been impacted by prior training, nonetheless. Previous trainings in schools focused on promoting a growth mindset in both faculty and students. Dweck's work has been so popular in schools that when an educator is asked about mindset, the default answer is "growth mindset" independent of the setting or specific question—reducing the research to a buzzword. Mindset has been abridged to a dichotomous choice, growth/fixed, failing to consider that in Dweck's actual research she found that individuals have a dynamic mix of fixed and incremental mindsets. Like the damage that "contrived collegiality" does to culture in lieu of meaningful trusting relationships (Hargreaves, 1992), a "false growth mindset" undermines the hard work embedded in recognizing when fixed-mindset thoughts happen so that educators can work through them (Dweck, 2015).

Day and Gregory (2017) proposed a directional relationship in their faucet-filter feedback model where mindset and the mindfulness restrict the incoming feedback reducing the amount of information available for growth. This research tested the directionality of the relationship and found that mindfulness predicts mindset more strongly than mindset predicts mindfulness. Respondents scores on the FFMQ predicted 4.6% of the variance in the mindset scores. The directionality of these findings suggests that Day and Gregory may want to reorder the filters in the faucet-filter feedback model.

Limitations

The sample of educators included many pre-service educators, which may affect the findings. Pre-service educators, while closer to the most current theories in education may lack sufficient experience to calibrate their responses on a self-report instrument. The results did not significantly vary by subgroup, but a larger portion of more experienced educators may shift these results.

Another limitation of the current study was in the choice of instrumentation. Because the studied constructs were implicit, the research relied on self-report measures. This type of instrumentation requires that the responded honestly and accurately report on their own thoughts and actions. While no identifiers were collected, and the surveys were collected online, over a period of years, the respondents may have reported more socially desirable than actual answers (Dweck, 2015; Patrick & Joshi, 2019). Indeed, the respondents may not have even done this consciously, as the educators' subconscious ego defensive mechanisms could cause the educator to answer as they would like to be seen, or like to be, rather than deeply consider how they truly feel, so caution in interpretation is warranted.

While beyond the scope of the current investigation, it might be interesting to track the mean score on the DMI since it was published in 1995 to now. As p-12 districts embrace and promote the power of growth mindset, the average score of the self-reported measure may be changing to reflect the social norm. This could explain why the attribute subscale was a little higher than the intelligence subscale and why the attribute subscale was significantly correlated with mindfulness, but the intelligence subscale was not. Patrick and Joshi (2019) warn that many educators claim that they hold a growth mindset without understanding what it is. Dweck (2015) writes,

> In many quarters, a growth mindset had become the right thing to have, the right way to think. It was as though educators were faced with a choice: Are you an enlightened person who fosters students' well-being? Or are you an unenlightened person, with a fixed mindset, who undermines them? So, of course, many claimed the growth-mindset identity (para. 8).

Similarly, Anderson et al. (2018) argue that educator professional development equates to identity work.

Conclusions and Implications

The relationship between mindset and mindfulness suggests that professional development targeted towards one of these two constructs may also influence the other in a desirable way. Research has already established that changes in educator mindset can improve student academic outcomes (Blackwell et al., 2007; De Castella & Byrne, 2015; Gonida et al., 2006; Paunesku et al., 2015). Likewise, mindfulness practices in schools are associated with positive outcomes in schools (Biegel & Brown, 2010; Caballero et al., 2019; Zenner et al., 2014). Educational leaders can use the results of this research to promote mindfulness efforts and recapture the nuanced meaning of Dweck's mindset theory to engage educators in the ongoing, meaningful work of professional growth.

With the global pandemic heightening the level of attention devoted to self-care and emotional well-being, these findings further support that strategies intended to increase mindfulness are also predicted to move mindset towards an incremental/growth orientation. Trombly (2020) noted that especially during COVID-19, "district- and building-level leaders must provide teachers, counselors and other specialists with the resources, the support and the ongoing professional learning experiences that they require in order to do their best work with students and families" (p. 356). Providing necessary, and ongoing, professional learning focused on mindfulness and mindset will likely encourage the difficult identity work of developing educator professional capacity.

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