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Stress mindset predicts job turnover among preschool teachers☆

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ABSTRACT

Teaching is one of the most challenging jobs, with a high turnover rate. Unfortunately, we know very little about how to retain teachers. This longitudinal field study (N = 310) examined whether preschool teachers' stress mindset—that is, whether they believe stress is harmful or beneficial—predicted their job stress and turnover within a school year. The results suggested that teachers who believe in the potential benefits of stress experienced less job stress, and were therefore less likely to leave their jobs as quickly. These findings suggest that teachers' stress mindsets predict their psychological well-being and professional development.

1. Stress mindset predicts job turnover among preschool teachers

Teaching is unquestionably a difficult occupation. Teachers of young children face numerous challenges, including poor work environments, low salaries, low job status, and relational problems with co-workers, students, and parents. Not surprisingly, the job turnover rate—that is, the number of child care workers and preschool teachers leaving their centers or schools each year—is high. In the United States, about 30% of preschool teachers leave their jobs, more than four times the 7% turnover rate among elementary school teachers (Whitebook & Bellm, 1999). This high turnover rate is not limited to the U.S. In 2014, about 24% of Korean child care teachers quit their jobs, and in 2015, about 75% of child care centers hired at least one new teacher (Korea Institute of Child Care and Education [KICCE], 2016).

Teacher turnover is economically, institutionally, and educationally costly. Each year, $2.2 to $4.9 billion is spent on recruiting and training new teachers (Kersaint, 2005). In addition to these tangible costs, teacher turnover incurs less measurable institutional costs by disrupting team-based working environments. When a teacher leaves, the remaining teachers feel abandoned (Hamrick, 2000), which can weaken their sense of community (Guin, 2004). The remaining teachers also must invest extra time and effort to build a relationship with new teachers and help them adjust; this additional work can take time away from their own students. Additionally, frequent changes in teaching staff can erode relational trust between the child care center and families.

The most troubling consequence of teacher turnover rate is its effect on students. High turnover of experienced teachers who can provide comprehensive and coherent curriculum can weaken program quality (Hanushek, Kain, & Rivkin, 2004). Furthermore, students who have become attached to a teacher feel distressed by the loss, which can affect their cognitive development (Howes & Smith, 1995; Tran & Winsler, 2011). Most prior examinations of the link between teacher turnover rate and student achievement have shown that higher teacher turnover is correlated with lower student achievement (Boyd, Lankford, Loeb, & Wyckoff, 2005;

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Guin, 2004; Ronfeldt, Loeb, & Wyckoff, 2013). When a teacher leaves, his or her students have to put time and energy into forming a secure attachment with their new teacher rather than into exploring and learning (Cryer, Hurwitz, & Wolery, 2000). Additionally, because infants and toddlers build social expectations based on early experiences with their caregivers (Bowlby, 1982; Johnson, Dweck, & Chen, 2007), frequent changes in child care teachers may hinder children's social development. For example, preschoolers who experienced many incidents of teacher turnover are more likely to be socially withdrawn and aggressive (Howes & Hamilton, 1993). A longitudinal study also showed that 9-year-old children who experienced secure attachment when they were toddlers tend to have more positive relationships with their teachers (Howes, Hamilton, & Philipsen, 1998).

Losing a personal relationship with a teacher is especially harmful in early life because it disrupts young children's daily routines. Children younger than three are more upset than older children when their daily routine is interrupted (Whitebook & Granger, 1989). Furthermore, stresses elicited by such interruption in the first three years of life can lead to less effective coping mechanisms and memory capacity (Begley, 1997), both of which may snowball as the child matures. Due to these detrimental cognitive, social, and emotional effects, Squires (2004) described turnover among child care teachers as “America's other divorce crisis” (p. 74).

1.1. Job stress as an antecedent of turnover

Why do teachers leave their jobs? Job stress is most frequently cited reason. High job stress predicts teacher turnover (Hale-Jinks, Knopf, & Knopf, 2006) via burnout or lack of job satisfaction (Manlove, 1993, 1994; McClelland, 1986). Among child care teachers, the most frequently reported stressors are poor work conditions, long work hours, low salary, poor benefits, and perception of the job's low status (Albertson & Kagan, 1987; Borg, Riding, & Falzon, 1991; Fletcher & Payne, 1982; Galinsky, 1988; O'Connor & Clarke, 1990). Regions with large classes, high poverty, and large minority populations tend to have higher teacher stress and more turnover (Chen & Miller, 1997; Ingersoll & Merrill, 2010). Additionally, more than 70% of child care teachers believe that their salary is less than adequate, and the more dissatisfied they are with their salary, the higher their intention to leave their jobs (Stremmel, 1991). Teachers also experience relational stress from supervisors, co-workers, parents, and students (Curbow, Spratt, Ungaretti, McDonnell, & Breckler, 2000; Kelly & Berthelsen, 1995; Sass, Seal, & Martin, 2011; Wells, 2015). In addition to organizational characteristics, teacher characteristics, such as gender and teaching experiences, have an important role in job stress. Women and less experienced teachers tend to report more job stress and have a higher turnover rate (Chen & Miller, 1997; Hughes, 2012; Klassen & Chiu, 2010; Ronfeldt, 2012).

Every effort should be made to retain teachers by eliminating or minimizing the environmental factors that create job-related stress. However, another way to reduce job-related stress is through changing teachers' beliefs about the effects of stress. Even when sharing a working environment, some teachers feel more stress than others. In other words, objective stressors are only loosely coupled with subjective distress. As such, prior work (Cohen, Kamarck, & Mermelstein, 1983) suggests that the relationship between the number of objective life stressors and psychological distress is relatively weak ($r = 0.17$ to 0.20).

1.2. Stress mindset as an antecedent of job stress

One possible explanation for the weak correlation is *stress mindset*, or implicit beliefs about the effects of stress. Crum and colleagues (Crum, Salovey, & Achor, 2013; Crum & Zuckerman, 2017; Jamieson, Crum, Goyer, Marotta, & Akinola, 2018) suggest that individuals can have different expectations about the effects of stress on their health, well-being, learning, and growth. Individuals who hold a *stress-is-enhancing* mindset believe that stress can facilitate learning, growth, health, and vitality. In contrast, individuals who have a *stress-is-debilitating* mindset believe that stress inevitably decreases performance and productivity, and depletes their health and vitality (Crum et al., 2013).

In both children and adults, a stress-is-enhancing mindset predicts more adaptive life outcomes (Crum et al., 2013; Park et al., 2018). Middle school students with a stress-is-enhancing mindset experienced less distress, and this effect was greater among students who encountered many adverse life events (Park et al., 2018). In adults, a stress-is-enhancing mindset has been found to decrease distress, depression, and anxiety as well as increase energy, work performance, and life satisfaction (Crum et al., 2013). Furthermore, when expecting a heavy workload, employees with a stress-is-enhancing mindset tend to engage in more planning and scheduling (Casper, Sonnentag, & Tremmel, 2017). Stress mindset is also related to morbidity and mortality. Individuals with a stress-is-debilitating mindset are more than twice as likely to be diagnosed with coronary heart disease (Nabi et al., 2013).

Causal evidence supports the link between stress mindset and life outcomes (Ben-Avi, Toker, & Heller, 2018; Crum et al., 2013). When participants watched short videos about the positive effects of stress (e.g., improved muscle tone, improved immunity), they reported fewer psychological symptoms and higher work performance than did people who watched videos highlighting its negative effects (e.g., loss of enjoyment, burnout) or those who did not watch any videos (Crum et al., 2013).

Although stress mindset has been found to predict emotional (Crum et al., 2013), psychological (Crum et al., 2013; Park et al., 2018), cognitive (Casper et al., 2017), and health outcomes (Crum et al., 2013; Keller et al., 2012; Nabi et al., 2013), virtually nothing is known about its effect on actual behavioral outcomes. Also, the effect has been found in either cross-sectional or short-term longitudinal studies, so it is still unknown whether the effects of stress mindset hold for the duration of a school year. Additionally, although stress can vary widely across occupations (Johnson et al., 2005), prior research has tested the effects of stress mindset on students or employees in general rather than individuals in specific occupations (Ben-Avi et al., 2018; Casper et al., 2017; Crum, Akinola, Martin, & Fath, 2017; Park et al., 2018). Only one study (Crum et al., 2013) has examined employees working at a large international financial company. The study showed that individuals with a stress-is-enhancing mindset had lower anxiety and depression as well as higher life satisfaction and self-rated job performance than those with a stress-is-debilitating mindset.

Another important gap in the stress mindset literature is that the effect has rarely been examined outside of Western countries. Prior work has suggested that people from different cultures react differently to stress (Cross, 1995; Taylor, Welch, Kim, & Sherman, 2007; Tweed, White, & Lehman, 2004). For example, Westerners are more likely to engage in positive appraisal and more willing to seek explicit social support than Asians are (Heine & Lehman, 1995; Taylor et al., 2007; Tweed et al., 2004). Given such differences, it is reasonable to believe that the effects of stress mindset may differ across cultures. In contrast, studies of mindset in other domains (e.g., mindset about intelligence and personality) suggest that the mean level and the effects of mindset are robust across cultures. For example, the effects of mindset about intelligence on affective, cognitive, and behavioral outcomes were very similar between Eastern and Western cultures (Hong, Chiu, Dweck, Lin, & Wan, 1999; Kim, Zhang, & Park, 2018; Park & Kim, 2015). To our knowledge, there are no studies examining the effects of individual's stress mindset in non-Western cultures. A recent study (Ben-Avi et al., 2018) examined Israeli college students and employees, but the study manipulated stress mindset rather than measuring an individual's stress mindset. Thus, it is unknown whether individuals hold different levels of stress mindset and whether or not that mindset has similar effects in non-Western cultures.

1.3. Current investigation

The current longitudinal field study examined more than 300 Korean preschool teachers to test whether their stress mindsets predicted their psychological distress, leading to job turnover within the school year. We expected child care teachers with a stress-is-enhancing mindset to experience little job stress at the beginning of the school year, and that they would also be more likely to stay in their job by the end of the school year. In other words, we hypothesized that teachers' job stress would be a mediator between stress mindset and job turnover. In sum, our study adds to existing literature at least three important ways: testing 1) whether a stress mindset has longitudinal effects, 2) whether the mindset predicts actual behaviors (i.e., job turnover), and 3) whether the mindset effect is cross-culturally robust.

Crum et al. (2013) stated that stress mindset differs from other coping strategies. Mindset is an individual's beliefs or expectation about the effects of stress while coping strategies include cognitive and behavioral resources to combat or reduce stress (Folkman & Lazarus, 1985; Penley, Tomaka, & Wiebe, 2002), which perpetuate the stress–is-debilitating mindset. Thus, a stress mindset can influence the coping strategy that one adopts but is not itself a coping strategy. As such, empirical data has shown that stress mindset has weak to moderate correlations ($|r| = 0.05$ to.27) with coping strategies, such as approach, social, distractive, and avoidance coping (Crum et al., 2013). Stress mindset influences how an individual responds to objective stressors while coping strategies influence how an individual responds when stress is high. Accordingly, the literature examines stress mindset as an antecedent of psychological distress rather than a moderator between stressors and stress outcomes (Ben-Avi et al., 2018; Crum et al., 2013; Park et al., 2018). Thus, in the current work, we examine whether stress mindset influences how much stress teachers feel at work, not how their emotional responses influence their decision to leave their current job.

2. Methods

2.1. Participants and procedure

The current study was conducted in South Korea, where the school year begins in March and ends in February. In the Korean education system, children up to age 5 attend child care centers run by local governments, companies, nonprofit organizations, family child care homes, or private institutions. We recruited 567 child care teachers by randomly calling daycare centers across Korea. In March and April, at the start of the school year, teachers were sent a survey link via text message to measure their beginning-of-the year stress mindset and job stress. At the end of the school year (in February), researchers called the center or each teacher to assess turnover.

A total of 366 teachers (65%) completed the online survey. Of these, 48 (8%) teachers who did not answer an attention check question ("Please select *strongly agree* for this question.") correctly were removed. Seven teachers were excluded because they indicated that they left their jobs only because the centers that employed them had closed. One additional teacher was removed because we were unable to follow up with her. This left a final sample of 310 teachers from 65 daycare centers in four provinces in Korea. Among them, 94% (290 out of 310) were female. About 41% teachers were in their twenties, 32% were in their thirties, and 27% were in their forties or older. The mean teaching experience of participating teachers was 73.44 months ($SD = 44.56$), ranged from 3 to 144 months, and the average class size was 10.72 ($SD = 6.35$) children per classroom, ranging from 3 to 23. About 7% of participating teachers were in a classroom for children under the age of 1, 21% for 1-year-olds, 23% for 2-year-olds, 15% for 3-year-olds, 8% for 4-year-olds, 13% for 5-year olds, and 13% for children in a range of ages. The average salary was about 1,665,000 KRW (about 1500 USD) per month ($SD = 450{,}000$ KRW).

2.2. Measures

2.2.1. Stress mindsets

We used a Stress-Mindset Measure (SMM) (Crum et al., 2013) to explore teachers' beliefs about stress. A native speaker of Korean who lived in the U.S. for more than 10 years translated the stress mindset measure into Korean, and another translator translated it back into English. The measure comprises eight items measured on a 5-point Likert scale, with four items measuring a stress-is-enhancing mindset and four items measuring a stress-is-debilitating mindset. Items measuring the stress-is-debilitating mindset were

reverse-coded so that higher scores represent stress-is-enhancing mindsets, whereas low scores represent stress-is-debilitating mindsets. For reliability, we calculated McDonald (1999), which provides more accurate reliability estimates with more appropriate assumptions than Cronbach's alpha. Omega was.88.[2] For more information about psychometric properties of the measure and additional analyses, see Appendix S1.

2.2.2. Job stress

The child care teachers' job stress scale was adapted from D'Arienzo, Moracco, and Krajewski (1982). The scale was validated for Korean child care teachers (Shin & Rhee, 2005), and measures stress accumulated from the lack of leadership and administrative support, heavy workload, and relational problems with colleagues and parents. The scale consists of 27 items measured on a 5-point Likert scale. A higher score indicates greater job stress. Omega was.85.[3] For more information about psychometric properties of the measure and additional analyses, see Appendix S1.

2.2.3. Teacher turnover

We obtained data on teacher turnover status by calling the centers ($n = 295$) or individual teachers ($n = 15$).

2.2.4. Control variables

Based on the prior work indicating that school enviroment and teacher characteristics play an important role in job stress and turnover, we adjusted for center types, monthly salary, gender, teaching experience, and class size (Abel & Sewell, 1999; Chen & Miller, 1997; Ingersoll, 2011; Ingersoll & Merrill, 2010).

3. Results

3.1. Analytic strategy

3.1.1. Multilevel mediation model

Because teachers were nested within 65 daycare centers, we conducted a multilevel mediation analysis (Preacher, Zyphur, & Zhang, 2010) using *Mplus* (Muthén & Muthén, 2017) to account for within/between-center variation. Also, because our primary outcome was binary, we used generalized linear mixed modeling (GLMM). As Fig. 1 shows, we hypothesized that stress mindset would predict job stress, which would then predict turnover even after accounting for gender (Level 1), teaching experience (Level 1), monthly salary (Level 1), class size (Level 1), and center type (run by local governments, companies, nonprofit organizations, family child care homes, or private institutions; Level 2). Because we were not interested in cross-level interactions, we tested a random-intercept, fixed-slope model. Intraclass correlation coefficients (ICCs) were 0.18 for job stress and 0.23 for job turnover. This indicates 18% and 23% of variance in turnover rate and job stress, respectively, across the centers. For ease of interpretation, we grand-mean centered all predictors.

3.1.2. Model 1: the relationship between stress mindset and job stress

We first examined whether stress mindset (SM) predicts job stress (JST) at the beginning of the school year after controlling for the covariates. The model equations are:

Level 1:

$$\mathrm{JST}_{ij} = \beta_{0j} + \beta_1(\mathrm{SM})_{ij} + \beta_2(\mathrm{Gender})_{ij} + \beta_3(\mathrm{Teaching\ Experience})_{ij} + \beta_4(\mathrm{Salary})_{ij} + \beta_5(\mathrm{Class\ Size})_{ij} + \mathrm{r}_{ij}$$

Level 2:

$$\beta_{0j=}\gamma_{00} + \gamma_{01}(\mathrm{Center\ type1})_j + \gamma_{02}(\mathrm{Center\ type2})_j + \gamma_{03}(\mathrm{Center\ type3})_j + \gamma_{04}(\mathrm{Center\ type4})_j + u_{0j.}$$

Note. r_{ij} presents the variation between the teachers in a same school, and u_{0j} is for the variation between the schools. We also assume that $r_{ij} \sim N(0, \tau^2)$ and $u_{0j} \sim N(0, \sigma^2)$. This assumption is same for all the models in this study.

3.1.3. Model 2: the relationship between stress mindset and turnover

We then examined whether stress mindset, measured at the beginning of the school year, predicts teachers' turnover at the end of the school year, even after accounting for the covariates (gender, teaching experience, salary, class size, and center type). The model equations are:

Level 1:

$$log\frac{\pi_{ij}}{1-\pi_{ij}} = \beta_{0j} + \beta_1(\mathrm{SM})_{ij} + \beta_2(\mathrm{Gender})_{ij} + \beta_3(\mathrm{Teaching\ Experience})_{ij} + \beta_4(\mathrm{Salary})_{ij} + \beta_5(\mathrm{Class\ Size})_{ij}$$

Level 2:

[2] The observed alphas were 0.86 in Crum et al. (2013).
[3] The observed alphas were 0.89 in Shin and Rhee (2005).

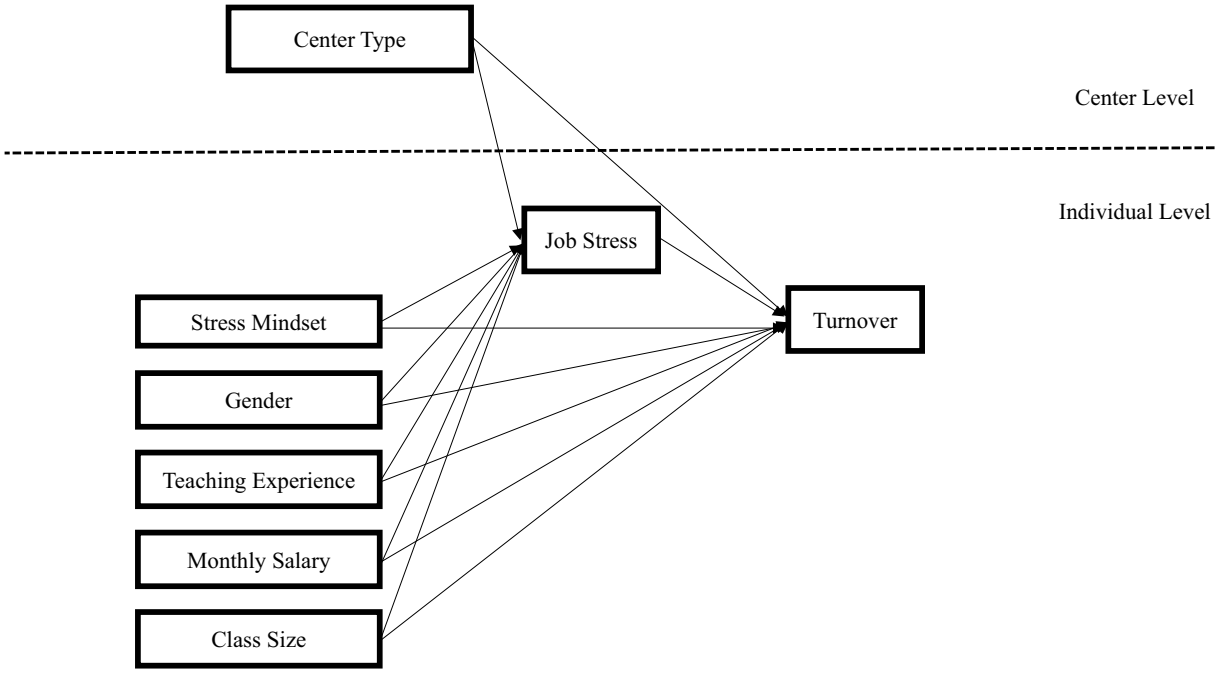

Fig. 1. Relationship between stress mindset and job stress.

$$\beta_{0j=}\gamma_{00} + \gamma_{01}(\text{Center type1})_j + \gamma_{02}(\text{Center type2})_j + \gamma_{03}(\text{Center type3})_j + \gamma_{04}(\text{Center type4})_j + u_{0j.}$$

Note. π_{ij} is the probability for the i-th teacher in the j-th school to leave, that is, $\pi_{ij} = \Pr(T_{ij} = 1)$.

3.1.4. Model 3: mediation analyses

Finally, we examined whether stress mindset predicts turnover (total effect), and whether its effect became non-significant or smaller when job stress was included in the model (direct effect). The model equations testing the total effects are:

Level 1:

$$log\frac{\pi_{ij}}{1-\pi_{ij}} = \beta_{0j} + \beta_1(\text{SM})_{ij} + \beta_2(\text{Gender})_{ij} + \beta_3(\text{Teaching Experience})_{ij} + \beta_4(\text{Salary})_{ij} + \beta_5(\text{Class Size})_{ij} + \beta_6(\text{JST})_{ij}$$

Level 2:

$$\beta_{0j=}\gamma_{00} + \gamma_{01}(\text{Center type1})_j + \gamma_{02}(\text{Center type2})_j + \gamma_{03}(\text{Center type3})_j + \gamma_{04}(\text{Center type4})_j + u_{0j.}$$

3.2. Descriptive analyses

Table 1 shows descriptive statistics and correlations between the main variables. The means were 2.31 ($SD = 0.72$) for stress mindset and 3.03 for job stress ($SD = 0.52$). About 27% of teachers (85 teachers of 310) left their centers within a year. The higher endorsement of stress-is-enhancing mindset was associated with less job stress, $r(308) = -0.25$, $p < .001$, and decreased turnover, r

Table 1
Descriptive statistics and correlations among variables.

		M	SD	1	2	3	4	5	6
1	Stress mindset	2.31	0.72	–					
2	Job stress	3.03	0.52	−0.25***	–				
3	Turnover (Turnover = 1)	0.27	0.45	−0.14*	0.19**	–			
4	Gender (Male = 1)	0.06	0.24	0.03	−0.01	0.05	–		
5	Teaching experience (month)	73.44	44.56	−0.03	−0.03	−0.13*	−0.05	–	
6	Monthly salary (KRW)	1,665,000	450,000	−0.07	0.03	−0.13*	0.07	0.14*	–
7	Class size	10.72	6.35	0.08	0.10	−0.02	−0.01	0.03	−0.05

*** $p < .001$.
** $p < .01$.
* $p < .05$.

Table 2
Mediation analyses: association between stress mindset and turnover through job stress.

	Model 1 (Outcome = Job Stress)		Model 2 (Outcome = Turn-over)		Model 3 (Outcome = Turn-over)	
	β (or γ)	SE	β (or γ)	SE	β (or γ)	SE
Intercept	0.00	0.04	−1.19***	0.20	−1.21***	0.21
Level 1 predictors						
Stress mindset	−0.19***	0.04	−0.58**	0.22	−0.46*	0.23
Gender	−0.05	0.11	0.28	0.56	0.35	0.57
Teaching experience	0.00	0.00	−0.01	0.00	−0.01	0.00
Salary	0.00	0.00	−0.01	0.00	−0.01	0.00
Class size	0.01**	0.01	0.01	0.03	0.00	0.03
Level 2 Predictors						
Center Type1	−0.08	0.12	−0.18	0.57	−0.16	0.56
Center Type2	−0.06	0.11	−0.25	0.54	−0.30	0.55
Center Type3	0.12	0.12	0.08	0.59	−0.08	0.62
Center Type4	−0.06	0.13	−0.99	0.69	−0.97	0.69
Level 1 Mediator						
Job Stress					0.79*	0.32
Variance						
Between	0.05**	0.02	0.82	0.52	0.69	0.53
Within	0.20***	0.02				

*** $p \leq .001$.
** $p \leq .01$.
* $p \leq .05$.

(308) = −0.14, $p = .012$. Greater job stress was positively associated with teacher turnover, r (308) = 0.19, $p < .01$, indicating that highly stressed teachers were more likely to leave their job within a year. Teachers with more teaching experience, r (308) = −0.13, $p = .025$, and higher salary, r (308) = −0.13, $p = .023$, were less likely to leave their jobs.

3.3. Multilevel mediation analyses

3.3.1. Model 1: the relationship between stress mindset and job stress

Table 2 shows that a higher endorsement of a stress-is-enhancing mindset is related to reduced job stress (β = −0.19, $p < .001$). Controlling for the covariates, a one-unit increase in stress mindset is associated with a 0.19 decrease in job stress.

3.3.2. Model 2: the relationship between stress mindset and turnover

Stress mindset predicted teacher turnover at the end of the school year, indicating that the teachers with a stress-is-enhancing mindset are more likely to stay in their job than those with a stress-is-debilitating mindset (β = −0.58, $p = .009$). More specifically, controlling for the covariates, each one-unit increase in stress mindset was associated with a 44.01% ($(1-\exp(-0.58))\times 100\%$) decrease in the odds of turnover.

3.3.3. Model 3: mediation analyses

The effects of job stress on job turnover was significant when controlling for stress mindset (β = 0.79, $p = .012$). Controlling for the covariates, each one-unit increase in job stress was associated with a 120.34% ($(\exp(0.79) - 1)\times 100\%$) increase in the odds of turnover.

For a significant mediation effect, there must be a significant indirect effect of stress mindset on turnover through job stress. When job stress was added to the model, we found a significant multilevel indirect effect (β = −0.15, $SE = 0.07$, $p = .025$). The association between stress mindset and turnover remained significant, but was reduced (β = −0.46, $p = .044$).

3.4. Alternative model

Because teachers' stress mindset and job stress were measured synchronously at the beginning of the school year, we considered the possibility that job stress affects stress mindset. In other words, we tested whether teachers with a lower level of job stress tend to hold a higher level of stress-is-enhancing mindset, which would predict their turnover within a year. The alternative model's Akaike information criterion (AIC; 10,035.781) and Bayesian information criterion (BIC; 10,200.191) were greater than the original model's AIC (10,017.320) and BIC (10,181.729). Typically, AIC and BIC with a difference greater than 10 provides very strong evidence in favor of the model with a smaller value (Franken, Laceulle, Van Aken, & Ormel, 2017; Raftery, 1995); thus, we concluded that our posited theoretical model fits the data better than this alternative model. Furthermore, the indirect effect from job stress to turnover

through stress mindset was not statistically significant (indirect effect = 0.17, SE = 0.09, p = .070).

4. Discussion

A stable relationship with a teacher promotes children's social, emotional, and cognitive development (Anderson, Nagle, Roberts, & Smith, 1981; Goossens & van IJzendoorn, 1990; Hale-Jinks et al., 2006; Howes & Smith, 1995). Unfortunately, the turnover rate among teachers is high, and we know little about how to retain them. The present study, for the first time, examined the role of teacher's stress mindset in job turnover. Although the effects of stress mindset on emotion, cognition, and health outcomes have been studied, the prior works were cross-sectional in design or conducted for a short-term period, mostly with participants from Western societies. In this field study, for the first time, we followed more than 300 Korean child care teachers to examine whether their stress mindset at the beginning of the school year predicted their turnover within the school year.

About 18% and 23% of the variance in turnover rate and job stress, respectively, were explained by the child care centers. This finding is consistent with prior work suggesting that school and organizational characteristics, such as administrative support and working conditions, are important factors in teacher retention (see Hughes, 2012 for a review). Conversely, 18% and 23% between-center variation indicates that 82% and 77% of the variance in job stress and turnover rate are driven by within-center factors. In other words, even in very similar working environments (potentially with similar objective stressors), subjectively perceived stress and the decision to leave a job vary considerably.

As predicted, teachers who can see the positive side of stress felt less job stress, and were less likely to leave their jobs within a year than were their co-workers who saw stress as strictly harmful. Importantly, these relations were significant even after accounting for gender, teaching experiences, monthly salary, and class size. Our alternative model testing suggested that teachers' mindset plays a role in perceived job stress rather than the other way around.

The low correlation between stress mindset and teaching experience found in this study indicates that a stress-is-enhancing mindset does not develop with additional years of teaching. Since a stress-is-debilitating mindset is predominant mindset for many people, a stress-is-enhancing mindset should be deliberately taught and supported. Dweck and colleagues (Dweck, Chiu, & Hong, 1995) conceptualize mindsets as stable yet malleable qualities. Accordingly, brief stress mindset manipulations (e.g., watching video clips supporting stress-is-enhancing mindset, recalling past experiences in which stress had positive effects) can alter individuals' mindset and benefit health and work performance (Ben-Avi et al., 2018; Crum et al., 2013). Thus, a stress mindset intervention for teachers at different stages in their careers may lower teachers' job stress and help career development. We will further discuss this issue in the limitations section.

It is important to note that because the stress mindset intervention work was conducted for a relatively short time, approximately two weeks, the long-term effects are unknown. However, we can draw some inferences from studies of other types of mindset. A substantial body of research supports the longitudinal effects of mindset on intelligence and personality (Blackwell, Trzesniewski, & Dweck, 2007; McCutchen, Jones, Carbonneau, & Mueller, 2016; Park, Gunderson, Tsukayama, Levine, & Beilock, 2016; Stipek & Gralinski, 1996; Yeager et al., 2014; Yeager, Miu, Powers, & Dweck, 2013). A longitudinal study of junior high school students (Blackwell et al., 2007) showed that an intervention altering children's mindset about intelligence predicted student math achievement at the end of the semester. Similarly, Yeager et al. (2013) showed that an intervention promoting growth mindset about personality reduced hostile intent attribution and desire for revenge over an 8-month period. Thus, future examinations of the longitudinal effect of stress mindset intervention may prove fruitful.

5. Limitations and directions for future research

The present study has several limitations which suggest exciting directions for future research. First, we asked only *whether* a teacher had left the center within a year; we did not ask *why*. Some might have lost interest in working at their assigned center, and others might have left for reasons that had nothing to do with the job, such as moving, pregnancy, health problems, and continuing education. Based on prior work indicating that teachers who experience a higher level of job stress are at greater risk for leaving the profession (Hale-Jinks et al., 2006; Sass et al., 2011), we speculate the former is more likely than the latter. Nevertheless, it will be useful to know whether those who left the centers abandoned teaching entirely or simply accepted employment at another center.

In addition, given the nature of this correlational field study, the causal link between stress mindset and job stress is unclear. Prior longitudinal work with children (Park et al., 2018) and experimental work (Crum et al., 2013) has suggested that stress mindset predicts psychological distress rather than the other way around. Our alternative model testing also supports this stress mindset to stress direction. Nevertheless, as noted earlier, an experimental study is needed to confirm the directionality of the current findings. Particularly, experimental studies randomly assigning teachers to receive stress mindset training or not could draw a clearer causal link among stress mindset, job stress, and turnover. Stress mindset can be altered by asking subjects to read a short scientific article or recall a personal experience (Ben-Avi et al., 2018; Crum et al., 2013). Thus, experimental interventions could be designed to improve teachers' stress-is-enhancing mindset either by providing scientific evidence on how stress can be utilized or by recalling and/or sharing a past experience supporting a stress-is-enhancing mindset. Future research could also examine whether the effects of such intervention vary among teachers at different stages of their teaching career (e.g., preservice, novice, experienced). Based on the finding that stress mindset is not correlated with teaching experience, we expect that the effects might be comparable, but of course future research is needed to evaluate the effects.

Relatedly, for practical reasons (e.g., because we recruited teachers from centers, we foresaw that we would not be able to reach teachers who had left the centers), we administered self-reported questionnaires only at Time 1, but not at Time 2. Also, if we had

measured teachers' stress and turnover at the same time, teachers might have falsely attributed the turnover to job stress, which could obscure the causal link. Given that mindset is thought to be stable without exogenous factors (e.g., intervention, big life events; Dweck et al., 1995), we speculate the results would have been similar if we measured job stress at Time 2, but future work measuring stress mindset and perceived stress at different time points would be informative.

Lastly, in this first study of individual difference in stress mindset among non-Western societies, we limited our sample to preschool teachers in Korea. Thus, the result should be interpreted with caution due to the translated scales. For instance, despite effort to minimize translational errors, different cultures may have different interpretations of stress or/and response tendencies. An important future direction will be to compare psychometric properties of scales and replicate the current findings in different cultures.

6. Conclusion

The present study has theoretical and practical implications. It extends the theoretical literature in three important ways. First, we demonstrate that teachers' beliefs about the effects of stress might influence not only their mental health but also their behavior. Second, teachers' stress mindset has longitudinal effects on behavior at least one academic year later. Third, the adaptive effects of stress-enhancing-mindset on mental health and behaviors are not limited to Western culture, rather cross-culturally robust. Our practical findings show that stress mindset is a promising candidate to support teachers' mental health and career development. A current trend in mindset intervention is the development of a scalable intervention that can be easily implemented in school (Dweck & Yeager, 2019; Paunesku et al., 2015). To our knowledge, there is no scalable intervention work to retain teachers. Understanding the psychological antecedents of job stress and turnover, such as stress mindset, can open the door for future scalable intervention work toward decreasing job stress and increasing teacher retention, thereby creating environments that are more conducive to children's development.

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Appendix A. Supplementary material

Supplementary material to this article can be found online at https://doi.org/10.1016/j.jsp.2019.11.002.

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