

ARTICLE

Resign or carry-on? District and principal leadership as drivers of change in teacher turnover intentions during the COVID-19 crisis: A latent growth model examination

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Abstract

During the COVID-19 pandemic, teachers in the United States, an already at-risk occupation group, experienced new work-related stressors, safety concerns, and work-life challenges, magnifying on-going retention concerns. Integrating the crisis management literature with the unfolding model of turnover, we theorize that leader actions trigger initial employee responses but also set the stage for on-going crisis response that influence changes in teachers' turnover intentions. We apply latent growth curve modelling to test our hypotheses based on a sample of 617 K-12 teachers using nine waves of data, including a baseline survey at the start of the 2020–2021 school year and eight follow-up surveys (2-week lags) through the Fall 2020 semester. In terms of overall adaptation, teachers on average, experienced an increase in work-life balance and a decrease in turnover intentions over the course of the semester. Results also suggest that district and school leadership provide unique and complementary resources, but leader behaviours that shape *initial* crisis responses do not similarly affect employee responses *during* crisis, contrary to theory. Instead, teachers' adaptive crisis response trajectories were triggered by continued resource provision over the semester; increasing provision of valued

resources (i.e., continued refinement of safety practices) and improvements in work-life balance prevented turnover intentions from spiralling throughout the crisis. Crisis management theory and research should continue to incorporate temporal dynamics and identify factors that contribute to crisis response trajectories, using designs and analyses that allow for examination as crises unfold in real time.

KEYWORDS

Turnover intentions, crisis management, education, safety, work-life balance

Practitioner points

- Organizational leaders have a responsibility to not only provide valuable resources to employees at the start of a crisis, but also need to find ways to continue to provide those resources throughout a crisis in order to effectively support employees.
- During a health-related crisis, actively helping to address employee health and safety concerns while also facilitating effective work-life management may result in systematically lower turnover intentions as the crisis continues.

INTRODUCTION

The chronic stress (Stauffer & Mason, 2013) and high turnover (Carver-Thomas & Darling-Hammond, 2017) already rampant among school teachers in the United States (US), and in the world as a whole (Thompson, 2021), have risen to an unparalleled crisis during the COVID-19 pandemic in the United States and around the world (UN News, 2020). Teachers, recognized as frontline workers (Pressley et al., 2021; Sokal et al., 2020), have faced additional stress (Chang & Yano, 2020) due to safety concerns (Wakui et al., 2021), rapid transitions to remote or hybrid teaching (Soncini et al., 2021), and exacerbated work-life challenges (Kraft et al., 2021; Sokal et al., 2020). Teacher attrition is linked to student development, education quality, and academic achievement (Sorensen & Ladd, 2020), and as a result, pandemic-driven teacher attrition has become an acute, global concern (Thompson, 2021). As such, Maxwell (2021) urged that ‘school and district leaders have an imperative to confront these challenges of morale, motivation, and engagement urgently ...’

The crisis management guidelines used in U.S. education are generally neither evidence-based (e.g., US Department of Education, 2007) nor developed for a global health crisis. Beyond that, evidence to guide teacher retention efforts from crisis management and turnover research is also inadequate for the COVID-19 context. Crisis management research tends to focus on preventing isolated, short-lived, internal crises (e.g., ethical violations in one workplace; Bowers et al., 2017), and turnover research has typically been conducted in stable circumstances. The limited turnover research during unstable circumstances suggests that poor internal organizational change management contributes to turnover intentions (e.g., Chen et al., 2011). Effective crisis management depends on the nature of the crisis (Bowers et al., 2017), yet COVID-19 is unlike crises from past research in that it is an unavoidable, external, on-going, ‘landscape scale crisis’ due to its massive scale, speed, uncertainty, and emotional impact (McKinsey & Company, 2020). Crisis management research broadly points to the role of leaders

(James et al., 2011), but there is no consensus around what key leader behaviours are needed during a crisis or the role of different leadership levels (e.g., senior, first-line; Bundy et al., 2017). Moreover, the dynamic nature of employees' responses to on-going crises have not been considered (Bundy et al., 2017; Williams et al., 2017), hindering understanding of how employees' changing responses during crisis eventually link to attrition. Thus, research is sorely needed to examine how leader actions across multiple levels relate to employees' dynamic responses during landscape-scale crises, like that created by the COVID-19 pandemic. Doing so would provide organizations with needed evidence-based recommendations and guide further theory development and refinement in crisis management.

We use a latent growth modeling (LGM) approach to assess how teacher experiences (i.e., safety concerns, work-life balance) and turnover intentions change over the course of a semester during COVID-19, as a function of leadership actions at the start of the semester. We rely on COVID-19 guidance (McKinsey & Company, 2020) to identify leader actions at two levels (*district* decision-making and safety communication; *principal*¹ authoritarian leadership and warmth) that may set the course for teachers' responses. We examine whether leader actions at each level relate to initial teacher turnover intentions at the start of the 2020–2021 school year through their influence on safety concerns and work-life balance, two primary COVID-19 challenges (Kraft et al., 2021; Lizana & Vega-Fernandez, 2021). We expect that district leadership influences teacher retention through structural mechanisms (i.e., district safety practices), whereas principal leadership exert influence through more interpersonal mechanisms (i.e., family support and work-family balance). Further, we theorize that leader actions not only trigger initial employee responses but also set the stage for on-going crisis response. Effective leader actions early on may begin a resource spiral (Hobfoll, 2011) or an accumulation of positive outcomes over time (Williams et al., 2017), which may be especially influential in the context of a crisis (Hobfoll et al., 2018). Thus, we also examine changes in turnover intentions, over the course of the Fall 2020 semester, as a function of initial leader actions and the semester-long trajectories in safety and work-life balance experiences they incite. In sum, our goals are to explain (a) why teachers intended to turnover at the start of the semester, and (b) what factors related to changes in turnover intentions during the semester. To do this, we surveyed 617 U.S. teachers every 2 weeks from August to December 2020.

We contribute to occupational health, crisis management, and turnover research by identifying actions first-line and senior leaders can take to retain employees during large-scale crisis, both initially and as the crisis unfolds. Using eight waves of data and LGM, we offer a rare look into crisis response in real time and test our theorizing that resource spirals relate to changes in teacher intentions to stay or leave their job as the COVID-19 crisis progresses. Practically, these findings inform how to proactively confront attrition during crises.

Theoretical explanation and analytic examination of spirals over time

Conservation of resources (COR) theory (Hobfoll, 1989) posits that people strive to acquire and protect resources and that threat or actual loss of resources creates stress. Unfortunately, initial resource loss lowers protections against future resource loss, which can create an exponentially fast and salient spiral of stress and resource loss. While resource gains can also spiral, gain spirals are generally slower and less impactful than loss spirals (Hobfoll et al., 2018). Relevant to the present context, however, resource gains increase in importance after significant resource loss; this is called the gain paradox principle (Hobfoll et al., 2018).

Crises are traumatic events that inherently threaten resources, and thus, are theoretically likely to induce loss spirals (Benotsch et al., 2000; Hobfoll, 1991). Per the gain paradox principle, any resource gain has the potential to exert a significant positive impact after a major crisis. Leaders have unique capacity to provide and protect employee resources in crisis (Williams et al., 2017), but leader requirements during crises differ from ordinary situations (Wooten & James, 2008), an issue explicitly

¹In the United States, a district provides local administration of elementary or secondary schools within a defined geographical area. By extension, a principal is responsible for administration of a given school within a school district.

recognized in the education literature regarding the effects of the COVID-19 crisis in schools relatively early in the pandemic (Weiner et al., 2021). McKinsey and Company (2020) outlines various leader behaviours relevant to the COVID-19 crisis including, (a) ‘command and control’ structures, (b) empathy, (c) effective decision-making, (d) transparent communication, and (e) optimism. Similarly, though lacking consensus, crisis management research suggests leader decision-making, communication, and empathy are key (Bundy et al., 2017; US Department of Education, 2007).²

In a school context, these leader actions, and the effect these behaviours have on resource availability, may differ for first-line versus senior leaders. At the outset of the pandemic, superintendents and school boards³ (senior leaders responsible for administration of a school district) typically made district-wide decisions about safety policies and communicated these decisions across schools within that district. In contrast, principals (first-line leaders responsible for the leadership of a given school) may have enacted strategies more relevant to regular, direct interactions with teachers. More specifically, authoritarian leadership is a ‘command and control’ style common in K-12 principals (Sanders, 2014) and may have particular appeal to certain types of leaders during a crisis (Huang et al., 2015). Together, these sources indicate that leader actions including district-level decision-making and safety communication, as well as principal authoritarian leadership and display of warmth (an indicator of empathy; Young et al., 2017) are key leader behaviours in the COVID-19 crisis (McKinsey & Company, 2020) that may have systematic and meaningful effects on teachers, especially as it relates to issues of teacher turnover (Eadie et al., 2021; Weiner et al., 2021).

Leaders are key gatekeepers to employee resources (Hobfoll et al., 2018). Their initial actions during a crisis situation, like the COVID-19 pandemic, providing or withholding resources in a time of significant resource deficit wherein resource gain would be particularly salient. As such, initial leader actions, such as decision-making, communication, authoritarian leadership, and warmth may shape not only initial employee resource levels but also whether the loss spurred by the crisis continues (loss spiral) or, alternatively, whether early resources can instead accumulate over time (gain spiral). People’s responses to a crisis are likely to be dynamic (i.e., changing over time; Preacher et al., 2008) as circumstances change and as people adapt. Consistent with COR (Hobfoll, 1989) and within-person theories of spirals (Lindsley et al., 1995), we suggest that systematic changes in phenomena over time indicate loss or gain spirals, which may be responses to meaningful changes in work experiences (Chen et al., 2011). Spirals shape interpretations: loss spirals foster expectations for more negative future experiences, whereas gain spirals foster positive expectations (Hobfoll et al., 2018; Hsee & Abelson, 1991).

Relatedly, the unfolding model of turnover (Lee et al., 1999) suggests that work dissatisfaction due to unmet needs is a reaction to shocks at work and is a driver of turnover. During COVID-19, two primary needs of teachers are safety from COVID-19 (Shapiro & Goodman, 2021) and support for work-life challenges (Kossek & Lee, 2020). Taken together, these theories provide our conceptual premise. During this shock or crisis, leader actions before the start of the Fall 2020 semester affect access to resources related to teacher safety and work-life balance needs (perceptions of effective safety procedures, family support) that in turn, contribute to both initial teacher experiences (safety concerns and work-life balance) and trajectories for those experiences during the Fall semester (spirals). Changes in teachers’ experiences related to their safety and work-life balance needs then prompt changes in turnover intentions as the semester unfolds.

To test these relationships, we use LGM which enables examination of change over time, particularly from a meaningful initial point, such as the start of the semester (Preacher et al., 2008). This approach provides information about average starting level (or ‘initial status’) on a variable (i.e., intercept; average initial turnover intentions) as well as the average rate of change over time (i.e., slope;

²Our data collection began before the publication of the McKinsey and Company (2020) report on leadership behaviors during a crisis. Our initial choice of variables was guided by the education crisis management literature (US Department of Education, 2007). Once frameworks specific COVID-19 were published, McKinsey and Company (2020) framework largely aligned with our model and thus, we provide a test of four of their five leader behaviors.

³Typically, states set guidelines on regarding masks, symptom screening, or social distancing, but district leaders have discretion as to how to adjust and adopt these guidelines (Byrnes, 2020). Within a state, modality varies by district with some choosing remote-only learning and others hybrid with in-person instruction. These decisions are most often made at the district, rather than the state or school level (“Map: Where are Schools Closed?”, 2021)

rate of decrease in turnover intentions). Whereas intercepts indicate initial crisis responses, slopes capture loss or gain spirals depicting on-going crisis responses. Regardless of initial starting point, we consider faster, more desirable changes on variables (e.g., faster declines in safety concerns and turnover intentions or increases in work-life balance) to indicate improved functioning during crisis, or gain spirals (Chen et al., 2011). LGM can be used to examine which baseline variables predict the starting level of a variable (intercept-to-intercept relation) as well as rate of change in the variable over time (intercept-to-slope relation) and whether change in one variable relates to change in another over time (slope-to-slope relation). Thus, we use LGM to examine the degree to which leader actions before the start of the Fall 2020 semester predict not only initial levels of mediators pertaining to safety and work-life balance and teacher turnover intentions (i.e., intercepts or initial crisis response) but also rate of change in these explanatory factors and turnover intentions over time (i.e., slopes, spirals, or crisis response trajectories).

Leader actions set the starting point and shape how quickly teachers respond

District actions

We examine how district decision-making and safety communication *before* the start of the semester relate to teachers' turnover intentions at the start of the semester (i.e., intercepts within our LGM analyses) and the rate of turnover intentions decline during the semester (i.e., slope within our LGM analyses). We examine whether this occurs via higher initial levels (intercepts) and faster improvements (slopes/spirals) in safety perceptions and safety concerns. To help provide clarity and connect our conceptual and analytical approach, intercept-to-intercept relationships are depicted in [Figure 1a](#) and slope relationships (intercept-to-slope and slope-to-slope) are in [Figure 1b](#). Consistent with standard LGM techniques, all effects were estimated simultaneously in the same model.

During public health crises, effective leadership requires effective decision-making. In general, rational decision-making involves gathering information, evaluating alternatives, selecting the best courses of action, implementing decisions, and monitoring results (Hadley et al., 2011; US Department of Education, 2007). In the context of educators experiencing the COVID-19 crisis, teachers expected senior leaders in the district (i.e., school boards, superintendents) to keep them safe from COVID-19 (Kim et al., 2020; Weiner et al., 2021) and desire this type of systematic, rational decision-making applied to safety protocol decisions (Al-Dabbagh, 2020). As such, we conceptualized effective decision-making as the degree to which teachers perceived that their district approached COVID-19 decisions in a rational way that involved sufficient information gathering and evaluation of multiple alternatives (Hadley et al., 2011). Such rational decision-making should foster better quality decisions regarding safety practices and implementations. Teacher evaluation of these district safety practices and implementations, then, was operationalized as the degree to which teachers perceived their district to be engaged in on-going development and revisions of safety policies, procedures, and practices.

Thus, when districts engage in rational decision-making before the start of the semester, teachers should start the semester with greater confidence that the district's safety policies and practices have been developed and implemented effectively (see H1a, [Figure 1a](#)). In addition, rational decision-making, as a process that involves implementing decisions, monitoring results, and adjusting courses of action, is also likely to accelerate refinements to safety practices, triggering a gain spiral, which prompts teachers to seek resources and expect more positive experiences (Hobfoll et al., 2018; Hsee & Abelson, 1991). Thus, district decision-making before the semester is expected to be associated with increasingly positive perceptions of safety practices (H1b, [Figure 1b](#)) during the semester.

H1a *District rational decision-making is positively related to district safety practices at the beginning of the semester.*

H1b *Higher district rational decision-making is related to greater increases in district safety practices over the semester.*

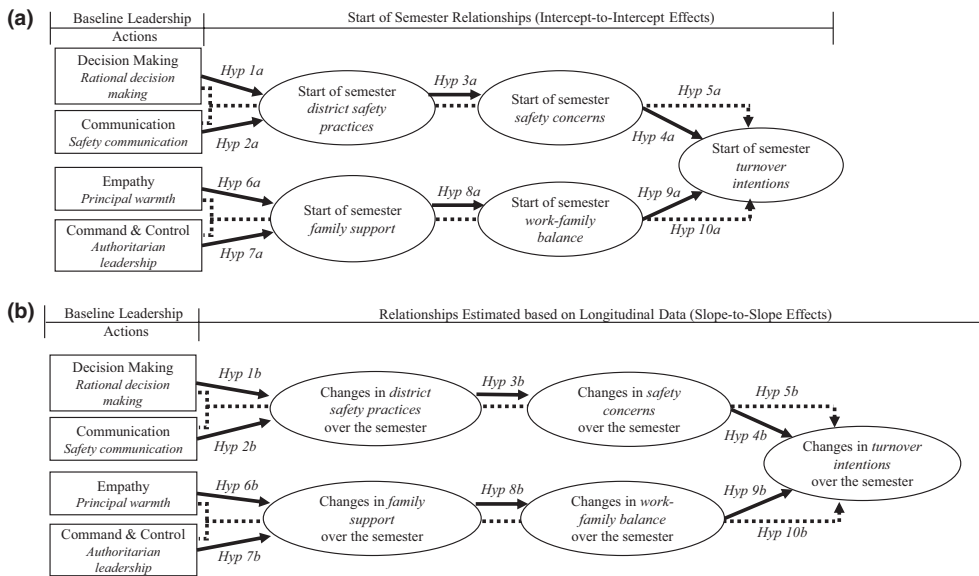


FIGURE 1 Conceptual model representing intercept-to-intercept (a) and intercept-to-slope as well as slope-to-slope (b) hypotheses. Solid lines represent direct effects, dotted lines represent indirect effects (*Note:* All hypotheses, across the two conceptual models, were tested simultaneously in the same LGM)

Additionally, when school districts communicate effectively about safety before the semester, initial teacher perceptions of district safety practices should be more positive, and these perceptions should improve more quickly during the crisis (a spiral). Within the current programme of research, we conceptualized district safety communication as teachers' perceptions that their districts effectively communicated about health and safety risks prior to returning for the 2020–2021 school year.

Research supports the key role of crisis communication (Mazzei et al., 2012), particularly about safety during a pandemic (Mackert et al., 2020). Transparent communication builds trust, and safety communication conveys safety is prioritized and policies are carefully developed (Hofmann et al., 2017) and increases expectations that policies will be refined over time. Thus, the more effective district leaders' safety communication, the more positive teachers' initial perceptions of safety practices at the start of the semester (H2a, Figure 1a). Also, given that communication builds trust and indicates safety is a priority, better communication starts a spiral such that teachers have increasingly positive perceptions that safety practices are refined during crisis (H2b, Figure 1b).

H2a *District safety communication is positively related to district safety practices at the beginning of the semester.*

H2b *Higher district safety communication is related to greater increases in district safety practices over the semester.*

In turn, we expect district safety practices relate to teacher safety concerns given that proper safety practices are linked to less COVID-19 anxiety for workers (Asmundson & Taylor, 2020). Here, safety concerns were conceptualized as teachers' stress levels related to COVID-19 health and safety concerns within their school. As such, when teachers view districts as taking adequate steps to refine and improve safety practices (i.e., higher initial district safety practice perceptions), then teachers' initial safety concerns, or stress related to COVID-19 safety, should be lower (H3a, Figure 1a). Importantly, as people experience faster improvements in perceptions of district safety practices over the course of the semester, this gain spiral should make it easier to interpret and expect future positive experiences (Hobfoll et al., 2018; Hsee & Abelson, 1991) and should more rapidly alleviate safety concerns during the semester (H3b, Figure 1b).

- H3a** *District safety practices at the beginning of the semester is negatively related to safety concerns at the beginning of the semester.*
- H3b** *Higher increases in district safety practices is related to greater decreases in safety concerns over the semester.*

Finally, we expect that teacher stress related to health and safety concerns proximally relate to teacher turnover intentions. Turnover can result from teachers' concerns with their job, such as when basic needs for safety are not met (Lee et al., 1999). Even in non-crisis periods, workplace safety is a salient concern related to higher turnover intentions (McCaughy et al., 2013). Safety is a foremost concern for teachers during COVID-19 (Shapiro & Goodman, 2021; Taylor, 2021) and has been linked to turnover intentions of other frontline workers (Bajrami et al., 2021; Labrague & de Los Santos, 2020). Thus, we expect that lower initial levels of teacher safety concerns relate to lower initial levels of turnover intentions (H4a, Figure 1a). Critically, we also expect that the faster teacher safety concerns decline during the semester, the faster their turnover intentions will also decline (H4b, Figure 1b). Collectively, we expect that district leader actions—decision-making and communication—link to teacher turnover intentions through perceptions of district safety practices and teacher safety concerns, both in terms of starting intercepts (H5a), as well as slopes/spirals (H5b, see Figure 1).

- H4a** *Safety concerns at the beginning of the semester is positively related to turnover intentions at the beginning of the semester.*
- H4b** *Greater decreases in safety concerns is related to greater decreases in turnover intentions over the semester.*
- H5a** *District rational decision-making and district safety communication are indirectly related to turnover intentions at the beginning of the semester through district safety practices and safety concerns.*
- H5b** *District rational decision-making and district safety communication are indirectly related to changes in turnover intentions over the semester through changes in district safety practices and safety concerns.*

Principal actions

Principals' authoritarian leadership and empathy pre-semester should relate to teachers' turnover intentions at the start of the semester (intercept) and the rate of turnover intentions decline during the semester (slope; Weiner et al., 2021). We posit that these effects occur through higher initial levels (intercepts, Figure 1a) and increasingly positive perceptions of family support and work-life balance (slopes; Figure 1b).

Authoritarian leaders dictate employee actions with absolute control (Schaubroeck et al., 2017), which relates to less psychological safety (Weiner et al., 2021; Wu et al., 2020) and more work–family conflict (Panahi & Shakeri, 2017). Family support involves leader support that helps employees manage their work and family lives⁴ (Allen, 2001). Authoritarian principals are unlikely to enact the understanding and empathetic actions that are core to family support (Allen, 2001) because they, by definition, struggle to offer flexibility needed to managing work-life issues (Kossek & Lee, 2020; Weiner et al., 2021). Thus, authoritarian principal behaviour, as measured before the Fall semester, should be perceived as providing less family support at the start of the semester (H6a, Figure 1a). Also, this initial rigidity is likely linked to resource loss (Hobfoll, 1989) such that it may trigger a loss spiral wherein the lack of family support becomes more and more salient over the semester (H6b, Figure 1b).

- H6a** *Authoritarian leadership at the beginning of the semester is negatively related to family support at the beginning of the semester.*
- H6b** *Higher authoritarian leadership is related to greater decreases in family support over the semester.*

⁴“Family supportive supervision” is often defined and measured based on Hammer et al.'s (2013) multidimensional conceptualization involving behaviors that include emotional and instrumental support, role modeling, creative management. Here, we refer to our construct as “family support” which reflects perception that the leader supports one's work and personal life but specific behavioral dimensions are not examined as we were interested in overall family support.

Empathy involves caring for and relating to another's emotions (Meinecke & Kauffeld, 2019). Leader warmth (i.e., being good-natured and sincere) is closely linked to empathy (Patient & Skarlicki, 2010; Scott et al., 2010), and as such, we operationally define empathy using a measure of principal warmth. Research on leader empathy is scarce (Burch et al., 2016) but finds it relates to employee well-being and leader performance (Meinecke & Kauffeld, 2019). Compassionate leadership, a related concept, is associated with more positive views of the work-life interface shortly after the onset of COVID-19 (Vaziri et al., 2020). We expect that when principals are warm and caring before the semester, their greater empathy enables them to provide greater support specific to work-life challenges (i.e., family support) such that teachers report higher initial family support (H7a, Figure 1a). Leaders providing greater resources also mobilize further resource gain in employees (Hobfoll, 2011). To this end, in their examination of leadership behaviours enacted by public school principals during the COVID-19 crisis, Weiner et al. (2021, p. 11) note that '[n]early every principal explained that demonstrating empathy... was a critical dimension of their leadership'. As such, empathy, as measured by principal warmth, may be a social resource that initiates a spiral such that teachers experience and perceive faster improvements in family support during the semester as they grow increasingly confident in using work-life supports provided by a warm leader (H7b, Figure 1b).

H7a *Principal warmth at the beginning of the semester is positively related to family support at the beginning of the semester.*

H7b *Higher principal warmth is related to greater increases in family support over the semester.*

In addition, we expect that family support provided by the principal relates to teacher work-life balance. Research has found family-supportive supervision relates to less work-family conflict (Lapierre & Allen, 2006) and turnover intentions and more work-family enrichment (Ode-Dusseau et al., 2012). Work-life balance occurs when work and non-work roles fit together harmoniously (Casper et al., 2018). While initial cross-sectional research has established a link between family-supportive supervision and work-life balance (e.g., Greenhaus et al., 2012), we are unaware of any research that has examined how changes in family support are associated with changes in work-life balance; the failure to account for temporal dynamics is a noted limitation within the work-family literature (Allen et al., 2019).

With these issues in mind, in line with COR theory, we expect that greater family support helps people manage work-life issues, thus we expect that when teachers perceive principals as higher on family support at the start of the semester, they will also report greater initial work-life balance (H8a, Figure 1a). Moreover, employees need to trust that work-family support is genuine to make full use of it (Masterson et al., 2021). In the uncertainty of COVID-19, these evaluations develop as teachers observe the provision of family support over the semester. Thus, as teachers' experience increasing family support during a crisis, this spiral should foster interpretations and expectations of future positive experiences, such that they experience faster improvements in work-life balance as they notice a pattern of principal support of their work-life balance efforts (H8b, Figure 1b).

H8a *Family support at the beginning of the semester is positively related to work-life balance at the beginning of the semester.*

H8b *Greater increases in family support is related to greater increases in work-life balance over the semester.*

Finally, low work-life balance is an undesirable state that people wish to rectify, and efforts to restore balance may include quitting a job (Wayne et al., 2017). Low work-life balance has been linked to teacher turnover during COVID-19 (Sokal et al., 2020). Thus, we expect teachers who start the semester with higher work-life balance will have lower initial turnover intentions (H9a, Figure 1a). We extend research linking work-life balance to turnover intentions (Wayne et al., 2017) by positing that, given that work-life balance is an undesirable state that prompts withdrawal behaviours, the faster that teachers' work-life balance improves during the semester, the faster their turnover intentions will decline (H9b, Figure 1b). Taken together, we expect principal actions—authoritarian leader and warmth/

empathy—relate to turnover intentions through family support and work-life balance, both in terms of starting point intercepts (H10a) and slopes (H10b, see [Figure 1](#)).

H9a *Work-life balance at the beginning of the semester is negatively related to turnover intentions at the beginning of the semester.*

H9b *Greater increases in work-life balance is related to greater decreases in turnover intentions over the semester.*

H10a *Principal warmth and authoritarian leadership are indirectly related to turnover intentions at the beginning of the semester, through initial family support and work-life balance.*

H10b *Principal warmth and authoritarian leadership are indirectly related to changes in turnover intentions over the semester, through changes in family support and work-life balance.*

METHODS

Participants and procedure

To test our hypotheses with adequate power, a large sample (i.e., 500 or more) was required (Ford et al., 2014). We partnered with a national teacher association to post invitations to the survey on educator-focused social media fora (e.g., Facebook groups).⁵ To capture data prior to the school year, the baseline survey was open 31 July to 8 September 2020. A total of 2311 primary and secondary educators in the United States accessed the baseline survey, and 84% ($n = 1943$) completed it. Of those, 58% ($n = 1137$) consented to participate in follow-up surveys and provided a valid email address.

As start dates differ across districts, we administered the first follow-up survey about 2 weeks after the self-reported first day for students, for a given teacher, on a rolling basis with invitations sent on Thursday, and reminders sent on Saturday. The other seven follow-up surveys⁶ were administered every 2 weeks through 17 December 2020. We selected a 2-week lag following Dormann and Van de Ven's (2014) temporal taxonomy theorizing that the proposed processes function within a mid-term stress-reaction framework. Further, frequent assessment results in more reliable estimates in LGM⁷ (Preacher et al., 2008).

Respondents were retained for analyses if they completed the baseline survey and at least one follow-up survey ($n = 617$; 54.2% retention rate). Respondents in the analysis sample completed, on average, 3.46 ($SD = 2.17$) follow-up surveys, were 92.4% female and, on average, 45.89 years of age ($SD = 9.60$), and had a school tenure of 9.45 years ($SD = 7.82$); 45% worked in a suburban school, 26.6% in an urban setting, and 26.3% in a rural setting. Over 90% reported working in a standard public school. About 67% were dual-earners, 46.8% had at least one child 18 years or younger, and 27.2% provided some adult dependent care.

Attrition analysis

We conducted a series of *one-way ANOVAs* to examine potential differences between our analysis sample ($n = 617$), those who opted in to the follow-up surveys but did not participate ($n = 520$), and those who declined to participate in follow-ups ($n = 806$). There were no baseline differences for age, school tenure, district decision-making, safety communication, or warmth. There was an overall effect for

⁵Prior to the administration of the survey, human subjects approval was granted by the [omitted to maintain blind review] Institutional Review Board; all persons gave their informed consent prior to their inclusion in the study.

⁶While respondents were asked to complete the baseline survey before the start of their school year, depending on start dates, the number of follow-up surveys available to participants varied between five and up to eight.

⁷While a shorter lag (i.e., 1 week) would allow additional assessments, the pandemic context required an approach that collects sufficient data while minimizing teachers' response burden and fatigue during the semester.

authoritarian leadership [$F(2, 1929) = 3.00, p = .05$], but the effect was weak ($\eta_p^2 = .003$; Cohen, 1988) and none of the *post-hoc* group comparisons were significant, suggesting limited potential for biases due to attrition.

Measures

People under stress disproportionately opt out of follow-up surveys in longitudinal research (Goodman & Blum, 1996; Young et al., 2007) if they perceive the time commitment to be too great (Burisch, 1984; Groves, 2004) or are over-surveyed, as educators are (Rogelberg & Luong, 1998). To manage fatigue and encourage continued engagement (Fuchs & Diamantopoulos, 2009), all constructs, other than work-life balance (Fisher et al., 2016), were assessed with single item measures developed for this research. We applied emerging best practices around the development and application of single-item measures in the organizational sciences (Matthews et al., 2022). Table 1 reports each item and additional psychometric information for each measure. All baseline variables were assessed on a 5-point *disagree-agree* scale. In follow-up surveys, participants responded based on the past 2 weeks using either a 4- or 5-point scale. For all scales, a higher score reflects a stronger endorsement of the construct.

While it is well documented that single-item measures can help researchers mitigate issues of respondent burden, survey length, and item repetition (Cheah et al., 2018; Fuchs & Diamantopoulos, 2009), and may demonstrate fewer issues with criteria contamination while still being construct valid (Drolet & Morrison, 2001; Fisher et al., 2016; Wanous & Hudy, 2001), best practices suggest it is necessary to demonstrate that those single-item measures are psychometrically and conceptually valid (Fuchs & Diamantopoulos, 2009). Per recommendations by Matthews et al. (2022), we took multiple steps to ensure measure quality, and describe these steps below.

Supplementary single-item validation study

In addition to having our single-item measures evaluated for content validity by a panel of subject matter experts from the partnering teachers' association, we also collected supplementary data from a sample of educators via [Prolofic.com](https://www.prolofic.com). As part of their existing functionality, [Prolofic.com](https://www.prolofic.com) allows researchers to apply inclusion criteria (based on previously collected data) to target their recruitment efforts. Using these pre-established filters, we recruited a sample of currently employed (K-12) educators. Respondents were also required to be U.S. residents with a 98% approval rating on previous surveys. They were paid \$1.45 for participating. While 104 respondents participated, four failed to complete the survey. We also excluded four respondents who indicated that they were post-secondary educators (i.e., not part of our target population) and four respondents who missed two or more of the embedded attention check items. The resulting analysis sample ($N = 92$) was 54.3% female. On average, the sample was 35.08 years of age ($SD = 10.52$), had a school tenure of 5.67 years ($SD = 6.04$). Approximately 50% reported working in a suburban school setting, 30.4% in an urban setting, and 19.5% in a rural setting. Approximately 70% reported working in a standard public school, with another 20.7% at an independent private school.

Within the data collection effort, the single-item measures from the focal study were presented first, followed by multi-item measures that were selected to evaluate the psychometric characteristics and validity of the focal single-item measures. As reported in Table 1, several of the multi-item measures had to be adapted to fit the study context (i.e., be applicable to educators) or to explicitly reference issues of health and safety (all items for the focal measures are available upon request). In terms of convergent validity, per Table 1, all single-item measures correlated at .62 or higher with their multi-item measure counterpart, with a range of .62 to .84. These correlations meet or exceed established guidelines for convergent validity of single-item measures (e.g., Wanous et al., 1997).

In turn, as is common in single-item validation studies (Fuchs & Diamantopoulos, 2009), we also conducted a series of exploratory factor analyses (EFA). This approach has a two-fold benefit. First,

TABLE 1 Focal study measures and associated validity information based on supplemental validity study ($n = 92$)

Baseline	Focal study measure	Convergent validity	Comm.	α	Multi-item source	Multi-item adaption notes
District decision-making	In planning for the upcoming school year, my school district has approached the decision-making process in a very rational way, gathering necessary information and evaluating alternatives before making decisions ^a	.84	.78	.96	Hamilton et al. (2016)	Reference the school district
District safety communication	My school district has effectively communicated with teachers about the health and safety risks of returning for the 2020–2021 school year ^a	.81	.91	.75	Goldhaber (1976)	Reference safety communication
Principal Warmth	My principal is good-natured, warm, and sincere	.78	.72	.95	Fiske et al. (2002)	Reference principal
Authoritarian leadership	My principal asserts absolute control and authority over the people in our school, demanding obedience from them ^a	.80	.80	.88	Du et al. (2020)	Reference principal
Lag administrations	Thinking about the past TWO WEEKS, my district continues to put effort into developing and revising effective policies, procedures, and practices related to protecting the health and safety of teachers, staff, and students ^a	.78	.76	.95	Idris et al. (2012)	Reference school district

(Continues)

TABLE 1 (Continued)

	Focal study measure	Convergent validity	Comm.	α	Multi-item source	Multi-item adaption notes
Family support	My principal is empathetic and supportive of my efforts to manage my work and family responsibilities ^a	.84	.81	.94	Hammer et al. (2013)	Reference principal
Safety concerns	How stressful were health and safety issues related to COVID-19 at your school for you over the past 2 weeks? ^b	.62	.58	.94	Vinodkumar & Bhasi (2009)	Reference COVID-19
Work-life balance	Thinking about the past TWO WEEKS, I felt like I had a good balance between my work and personal/family life ^a	.83	.78	.94	Valcour (2007)	None
Turnover intentions	How likely is it that you might quit/retire from teaching before the end of the 2020–2021 school year? ^c	.83	.83	.87	Carlson et al. (2017)	Reference turnover before end of year

Comm.: Commonality from EFA based on supplemental validation study. α : Cronbach's alpha for multi-item construct validation measure assessed in supplemental validation study. Response scales = a: 5-point *disagree-agree*, b: 5-point *stressfulness*, c: 4-point *likelihood*. All single items correlated at $p < .001$ with the corresponding multi-item convergent validity measure.

EFA assess whether the multi-item measures adapted to fit the study context remain psychometrically sound. That is, while all of the multi-item measures demonstrated strong internal consistency estimates (Table 1), the adaptations may have impacted, for example, the unidimensionality of the measures. Additionally, in conducting the EFAs, we were able to examine the communality of the single-item measures, as an established indicator of construct validity (Wanous & Hudy, 2001). A separate EFA (principal components) was conducted for each construct wherein both the multi-item and single-item measure were included. Single items loaded on their respective construct at or above .76 (additional details available upon request). The collective evidence thus suggests that the single-item measures are reliable and valid measures of the underlying construct (Spörrle & Bekk, 2014).

RESULTS

Table 2 reports descriptive statistics for all constructs. As noted, we adopted LGM to test our hypotheses (in *Mplus* 8 with standard data imputation methods). LGMs describe within-person changes in a single variable over time (e.g., how do teachers' turnover intentions change over the course of a semester?). They can also assess intraindividual differences in these change trajectories as well as antecedents and outcomes of such changes (e.g., do teachers' turnover intentions decrease over time when initial principal warmth is high?). To model linear change across the eight waves, we assigned each measurement with time scores in a linear fashion, from 0 to 7. As a preliminary step, we estimated univariate growth models for each lag construct to examine overall change patterns and the degree to which respondents differed in starting points and slopes of their trajectories. Per Table 3, work-life balance ($M_{\text{SLOPE}} = .06, p < .001$) and turnover intentions ($M_{\text{SLOPE}} = -.02, p = .002$) both demonstrated significant overall growth patterns; over the course of the semester, teachers on average, experienced an increase in work-life balance and a decrease in turnover intentions. Mean trends for work-life balance and turnover intentions are depicted in Figure 2. All constructs demonstrated significant variances in the intercept and slope factors, suggesting there were significant individual differences in both the starting points and the growth rates in these measures.

Next, we estimated a model representing all our study hypotheses (see Figure 3) using a conditional latent curve model (Bollen & Curran, 2006) by including and allowing the baseline measures to predict intercepts and slopes over time for district safety practices and family support. To provide a more conservative test of Hypotheses 1, 2, 6, and 7, we set all four baseline measures to predict intercepts and slopes for both district safety practices and family support. In turn, the two growth factors (i.e., intercept and slope) of district safety practices were allowed to predict the two growth factors of teacher safety concerns, which were set to predict the two growth factors of turnover intentions (see Figure 3 for a visual depiction). Likewise, the two growth factors of family support were set to predict the two growth factors of work-life balance, which were set to predict the two growth factors of turnover intentions. The four baseline (exogenous) variables were set free to correlate, and the remaining intercepts of our four process variables were set free to correlate.⁸

The initial model fit the data [$\chi^2(923) = 1675.17, p < .001, CFI = .885, RMSEA = .036$ (90% CI = .033, .039), SRMR = .076]. However, given the overall complexity of the model, we systematically examined (based on modification indices and residual error terms) if there were ways to improve model fit to improve overall understanding of potential underlying process. We identified one additional

⁸In preliminary examinations we considered several control variables, including initial teaching mode and experienced change in teaching mode over the Fall semester. And, based on data from the Center for Disease Control, we examined two state-wide infection rate variables and two death-rate variables. One infection rate variable was completed by taking the number of cumulative state-wide cases as of 31 August 2020 divided by number of cases as of 1 August 2020. A second infection rate variable was computed by taking cumulative state-wide cases as of 15 December 2020, divided by cases as of 1 August 2020. The same approach was used to estimate death rates (one for August, 2020, and one for the Fall semester). Higher scores represent states with more rapidly changing infection/death rates. Several controls were related to intercepts, but none systematically predicted slopes. The inclusion of these controls, across different models, did not influence the pattern of results. Thus, for reasons of parsimony, we exclude them from our results. Additional details available upon request.

TABLE 2 Descriptive statistics

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Rational decision-making (B)	2.55	1.20										
2. Safety communication (B)	1.72	.98	.50**									
3. Principal warmth (B)	3.59	1.21	.13**	.14**								
4. Authoritarian leadership (B)	2.54	1.22	-.07	-.08	-.58**							
5. Safety practices (T1)	2.71	1.24	.46**	.39**	.20**	-.09						
6. Principal FS (T1)	3.40	1.20	.15**	.21**	.46**	-.25**	.31**					
7. Safety concerns (T1)	3.44	1.27	-.28**	-.28**	-.12*	.03	-.34**	-.12*				
8. Work-life balance (T1)	2.13	1.07	.07	.12*	.08	.00	.14**	.18**	-.10			
9. Turnover intentions (T1)	2.21	1.42	-.13*	-.15**	-.06	.07	-.22**	-.24**	.24**	-.17**		
10. Safety practices (T2)	2.68	1.25	.38**	.34**	.26**	-.17**	.66**	.12	-.38**	.08	-.25**	
11. Principal FS (T2)	3.41	1.21	.21**	.26**	.49**	-.30**	.30**	.77**	-.15	.22**	-.16*	.27**
12. Safety concerns (T2)	3.51	1.35	-.18**	-.22**	-.19**	.12	-.35**	-.12	.63**	-.06	.24**	-.35**
13. Work-life balance (T2)	2.14	1.08	.04	.04	.11	-.03	.10	.12	-.15	.60**	-.11	.09
14. Turnover intentions (T2)	1.81	.96	-.10	-.15*	-.20**	.18**	-.31**	-.21**	.27**	-.12	.71**	-.31**
15. Safety practices (T3)	2.62	1.23	.37**	.37**	.22**	-.14*	.65**	.29**	-.31**	.19**	-.24**	.67**
16. Principal FS (T3)	3.32	1.23	.15*	.23**	.46**	-.36**	.23**	.63**	-.18*	.15*	-.15*	.35**
17. Safety concerns (T3)	3.40	1.33	-.21**	-.24**	-.14*	.12*	-.38**	-.20**	.48**	-.16*	.26**	-.41**
18. Work-life balance (T3)	2.30	1.13	.14*	.19**	.12*	-.09	.29**	.14	-.09	.59**	-.08	.25**
19. Turnover intentions (T3)	1.76	.92	-.13*	-.11	-.15*	.14*	-.32**	-.20**	.20**	-.17*	.64**	-.35**
20. Safety practices (T4)	2.71	1.22	.46**	.32**	.24**	-.07	.50**	.21**	-.25**	.14	-.06	.56**
21. Principal FS (T4)	3.47	1.21	.16*	.17**	.48**	-.33**	.31**	.66**	-.06	.14	-.18*	.29**
22. Safety concerns (T4)	3.47	1.26	-.19**	-.17**	-.04	.10	-.31**	-.26**	.36**	-.14	.19*	-.31**
23. Work-life balance (T4)	2.38	1.06	.16*	.05	.06	.02	.25**	.16*	-.17*	.54**	-.14	.24**
Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
24. Turnover intentions (T4)	1.83	.98	-.15*	-.10	-.13*	.15*	-.20**	-.09	.16*	-.16*	.66**	-.41**
25. Safety practices (T5)	2.63	1.19	.42**	.30**	.25**	-.20**	.61**	.25**	-.25**	.24**	-.18*	.58**

TABLE 2 (Continued)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
26. Principal FS (T5)	3.38	1.23	.26**	.21**	.46**	-.29**	.30**	.67**	-.15*	.25**	-.17*	.27**
27. Safety concerns (T5)	3.44	1.26	-.27**	-.28**	-.10	.06	-.32**	-.15*	.41**	-.24**	.21**	-.28**
28. Work-life balance (T5)	2.38	1.13	.13*	.14*	.08	-.12*	.26**	.18*	-.19*	.54**	-.06	.23**
29. Turnover intentions (T5)	1.77	.96	-.13*	-.06	-.06	.07	-.24**	-.18*	.21**	-.23**	.70**	-.28**
30. Safety practices (T6)	2.63	1.27	.40**	.30**	.26**	-.18**	.56**	.25**	-.33**	.17*	-.21**	.53**
31. Principal FS (T6)	3.25	1.31	.18**	.21**	.51**	-.34**	.20*	.59**	-.14	.21**	-.12	.19*
32. Safety concerns (T6)	3.61	1.33	-.24**	-.24**	-.16*	.13*	-.28**	-.17*	.42**	-.20*	.10	-.32**
33. Work-life balance (T6)	2.33	1.10	.03	.12	.03	-.04	.23**	.10	-.20*	.52**	-.07	.08
34. Turnover intentions (T6)	1.74	.93	-.17**	-.16*	-.05	.05	-.25**	-.15	.32**	-.16*	.76**	-.24**
35. Safety practices (T7)	2.66	1.24	.39**	.30**	.21**	-.08	.60**	.26**	-.19*	.23**	-.23**	.53**
36. Principal FS (T7)	3.32	1.23	.19**	.20**	.42**	-.30**	.24**	.58**	-.17	.32**	-.28**	.36**
37. Safety concerns (T7)	3.33	1.41	-.21**	-.27**	-.11	.11	-.11	-.13	.53**	-.24**	.20*	-.25**
38. Work-life balance (T7)	2.52	1.14	.09	.14*	.02	.04	.18*	.06	-.21*	.36**	-.01	.16
39. Turnover intentions (T7)	1.75	1.01	-.08	-.08	-.12	.11	-.22**	-.17*	.21*	-.21*	.71**	-.27**
40. Safety Practices (T8)	2.46	1.24	.35**	.16	.01	.02	.44**	.08	-.25*	.23	-.05	.35**
41. Principal FS (T8)	3.40	1.22	.15	.22*	.43**	-.31**	.05	.48**	-.23	.23	-.29*	.39**
42. Safety concerns (T8)	3.60	1.32	-.34**	-.21*	.06	.01	-.18	-.12	.46**	-.39**	.02	-.30*
43. Work-life balance (T8)	2.69	1.20	.04	.07	.06	-.08	.29*	.13	-.23	.46**	.17	.05
44. Turnover intentions (T8)	1.93	1.13	-.16	-.16	-.05	.10	-.15	-.09	.29*	-.21	.62**	-.25*
Variable	11	12	13	14	15	16	17	18	19	20	21	22
12. Safety concerns (T2)												
13. Work-life balance (T2)												
14. Turnover intentions (T2)												
15. Safety practices (T3)												
16. Principal FS (T3)												
17. Safety concerns (T3)												

(Continues)

TABLE 2 (Continued)

Variable	11	12	13	14	15	16	17	18	19	20	21	22
18. Work-Life balance (T3)	.24**	-.24**	.67**	-.22**	.23**	.24**	-.29**					
19. Turnover intentions (T3)	-.36**	.24**	-.23**	.78**	-.25**	-.24**	.27**	-.28**				
20. Safety practices (T4)	.30**	-.21*	.12	-.15	.59**	.29**	-.31**	.23**	-.23**			
21. Principal FS (T4)	.60**	-.17*	.15	-.24**	.38**	.68**	-.17*	.29**	-.28**	.37**		
22. Safety concerns (T4)	-.31**	.50**	-.16*	.25**	-.35**	-.29**	.65**	-.29**	.24**	-.33**	-.26**	
23. Work-Life Balance (T4)	.28**	-.25**	.65**	-.19*	.36**	.28**	-.39**	.68**	-.31**	.19**	.24**	-.27**
24. Turnover intentions (T4)	-.23**	.22**	-.07	.79**	-.32**	-.21**	.22**	-.22**	.74**	-.21**	-.29**	.26**
25. Safety practices (T5)	.39**	-.38**	.15	-.27**	.62**	.26**	-.31**	.25**	-.30**	.61**	.41**	-.33**
26. Principal FS (T5)	.72**	-.18*	.19*	-.21**	.42**	.73**	-.19*	.24**	-.24**	.34**	.70**	-.26**
27. Safety concerns (T5)	-.32**	.57**	-.24**	.22**	-.38**	-.24**	.55**	-.34**	.19*	-.29**	-.18*	.60**
28. Work-life balance (T5)	.28**	-.24**	.71**	-.22**	.33**	.14	-.30**	.73**	-.14	.17*	.21**	-.26**
Variable	11	12	13	14	15	16	17	18	19	20	21	22
29. Turnover intentions (T5)	-.27**	.25**	-.26**	.79**	-.29**	-.14	.21**	-.26**	.79**	-.19*	-.27**	.29**
30. Safety practices (T6)	.29**	-.49**	.05	-.30**	.59**	.28**	-.40**	.18*	-.22**	.51**	.38**	-.42**
31. Principal FS (T6)	.62**	-.24**	.17*	-.15	.39**	.68**	-.20*	.28**	-.15	.29**	.73**	-.16*
32. Safety concerns (T6)	-.23**	.54**	-.16	.16	-.37**	-.27**	.50**	-.32**	.22**	-.26**	-.22**	.60**
33. Work-life balance (T6)	.15	-.27**	.62**	-.16*	.21**	.10	-.19*	.65**	-.19*	.16*	.14	-.20**
34. Turnover intentions (T6)	-.23**	.24**	-.23**	.76**	-.25**	-.14	.22**	-.25**	.73**	-.15	-.24**	.25**
35. Safety practices (T7)	.31**	-.36**	.24**	-.18*	.61**	.17*	-.37**	.28**	-.27**	.56**	.32**	-.48**
36. Principal FS (T7)	.58**	-.26**	.22*	-.30**	.35**	.67**	-.24**	.37**	-.36**	.35**	.73**	-.25**

TABLE 2 (Continued)

Variable	11	12	13	14	15	16	17	18	19	20	21	22
37. Safety concerns (T7)	-.18*	.50**	-.13	.15	-.19*	-.15	.44**	-.19*	.19*	-.14	-.08	.47**
38. Work-life balance (T7)	.14	-.18*	.43**	-.22*	.12	.02	-.28**	.58**	-.18*	.13	.13	-.21*
39. Turnover intentions (T7)	-.20*	.17	-.17	.89**	-.25**	-.18*	.28**	-.27**	.79**	-.18*	-.25**	.30**
40. Safety practices (T8)	.24*	-.14	.05	-.12	.53**	.02	-.27*	.12	-.14	.44**	.27*	-.28*
41. Principal FS (T8)	.74**	-.23	.09	-.19	.36**	.65**	-.28*	.25*	-.27*	.31**	.66**	-.24*
42. Safety concerns (T8)	-.17	.47**	-.36**	.06	-.29*	-.05	.37**	-.33**	.17	-.16	-.24*	.48**
43. Work-life balance (T8)	.17	-.37**	.56**	.00	.12	.17	-.32**	.55**	-.08	.16	.15	-.20
44. Turnover intentions (T8)	-.18	.12	-.08	.67**	-.12	-.11	.24*	-.16	.68**	-.22	-.23*	.25*
Variable	23	24	25	26	27	28	29	30	31	32	33	34
24. Turnover intentions (T4)	-.20**											
25. Safety practices (T5)	.20**	-.36**										
26. Principal FS (T5)	.29**	-.18*	.41**									
27. Safety concerns (T5)	-.35**	.24**	-.39**	-.23**								
28. Work-life balance (T5)	.70**	-.13	.25**	.24**	-.30**							
29. Turnover intentions (T5)	-.36**	.80**	-.29**	-.29**	.27**	-.25**						
30. Safety practices (T6)	.21**	-.37**	.64**	.42**	-.50**	.17*	-.39**					
31. Principal FS (T6)	.16*	-.10	.35**	.78**	-.27**	.20**	-.24**	.39**				
32. Safety concerns (T6)	-.29**	.13	-.35**	-.24**	.59**	-.28**	.27**	-.46**	-.27**			

(Continues)

TABLE 2 (Continued)

Variable	23	24	25	26	27	28	29	30	31	32	33	34
33. Work-life balance (T6)	.62**	-.08	.17*	.17*	-.24**	.69**	-.24**	.21**	.20**	-.30**		
34. Turnover intentions (T6)	-.27**	.74**	-.27**	-.23**	.25**	-.22**	.87**	-.29**	-.24**	.19**	-.23**	
35. Safety practices (T7)	.23**	-.23**	.63**	.33**	-.48**	.22**	-.24**	.68**	.40**	-.50**	.27**	-.29**
36. Principal FS (T7)	.21*	-.32**	.38**	.70**	-.30**	.18*	-.36**	.43**	.76**	-.30**	.18*	-.34**
37. Safety concerns (T7)	-.19*	.17*	-.28**	-.12	.53**	-.21**	.25**	-.38**	-.20*	.63**	-.26**	.26**
38. Work-life balance (T7)	.53**	-.13	.14	.18*	-.25**	.61**	-.33**	.17*	.17*	-.18*	.57**	-.18*
39. Turnover intentions (T7)	-.30**	.75**	-.32**	-.26**	.25**	-.25**	.83**	-.29**	-.22**	.22**	-.22**	.86**
40. Safety Practices (T8)	.26*	-.29*	.60**	.31**	-.33**	.28*	-.40**	.60**	.29*	-.36**	.14	-.21
41. Principal FS (T8)	.24*	-.47**	.25*	.70**	-.32**	.08	-.37**	.44**	.80**	-.31**	.08	-.30**
42. Safety Concerns (T8)	-.47**	.32**	-.45**	-.18	.60**	-.29**	.41**	-.44**	-.20	.69**	-.37**	.29*
43. Work-Life Balance (T8)	.67**	.00	.14	.29**	-.28*	.59**	-.22*	.09	.05	-.25*	.63**	-.09
44. Turnover intentions (T8)	-.22	.74**	-.34**	-.27*	.37**	-.13	.76**	-.41**	-.20	.27*	.00	.81**
Variable	35	36	37	38	39	40	41	42	43			
36. Principal FS (T7)	.37**											
37. Safety concerns (T7)	-.33**	-.21**										
38. Work-life balance (T7)	.21**	.25**	-.26**									
39. Turnover intentions (T7)	-.60**	-.29**	.19**	-.22**								
40. Safety practices (T8)	.60**	.29*	-.19	.19	-.24*							
41. Principal FS (T8)	.15	.77**	-.20	.21	-.42**	.29**						
42. Safety concerns (T8)	-.52**	-.41**	.53**	-.30**	.37**	-.42**	-.28**					
43. Work-life balance (T8)	.25*	.29*	-.23*	.51**	-.18	.12	.11	-.32**				
44. Turnover intentions (T8)	-.31**	-.40**	.22	-.23*	.75**	-.23**	-.36**	.33**	-.09			

B. Assessed at baseline. T: Time. FS: family support. * $p < .05$; ** $p < .01$.

TABLE 3 Univariate latent growth model results (unstandardized)

Construct	χ^2	df	CFI	RMSEA	SRMR	Intercept mean	Slope mean	Intercept variance	Slope variance	Slope with intercept correlation
District safety practices	25.00	31	1.00	.00	.05	2.69**	-.02	.98**	.012**	-.04*
Family support	46.01*	31	.99	.03	.06	3.39**	-.01	1.13**	.019**	-.05**
Safety concerns	75.80**	31	.94	.05	.06	3.49**	.00	1.05**	.016**	-.04*
Work-life balance	34.52	31	1.00	.01	.07	2.10**	.06**	.73**	.011**	-.03*
Turnover intentions	80.84**	31	.97	.05	.06	1.89**	-.02**	.78**	.004**	-.01

* $p < .05$; ** $p < .01$.

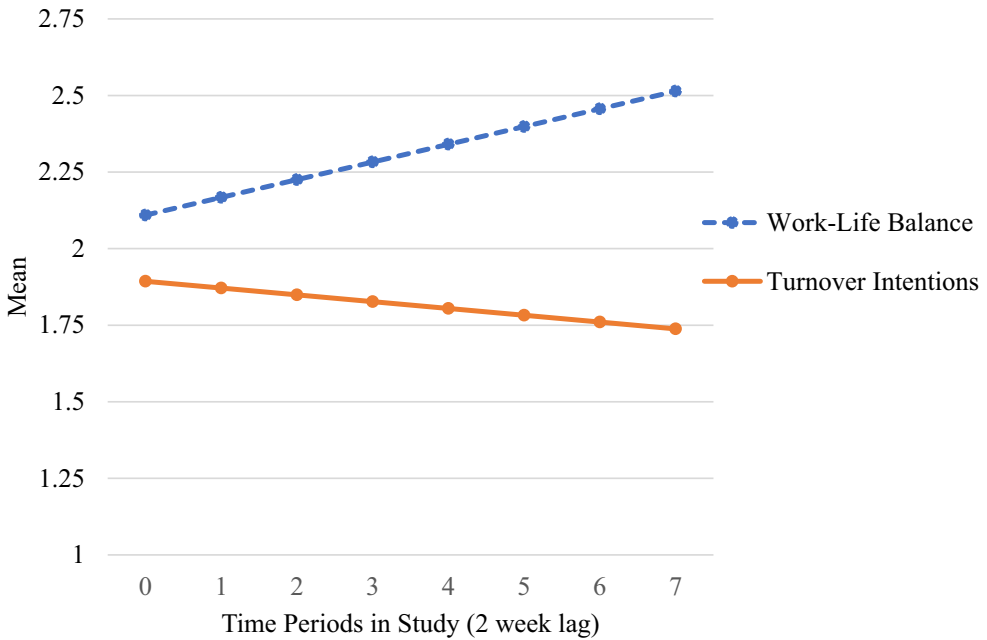


FIGURE 2 Mean trends for work-life balance and turnover intentions

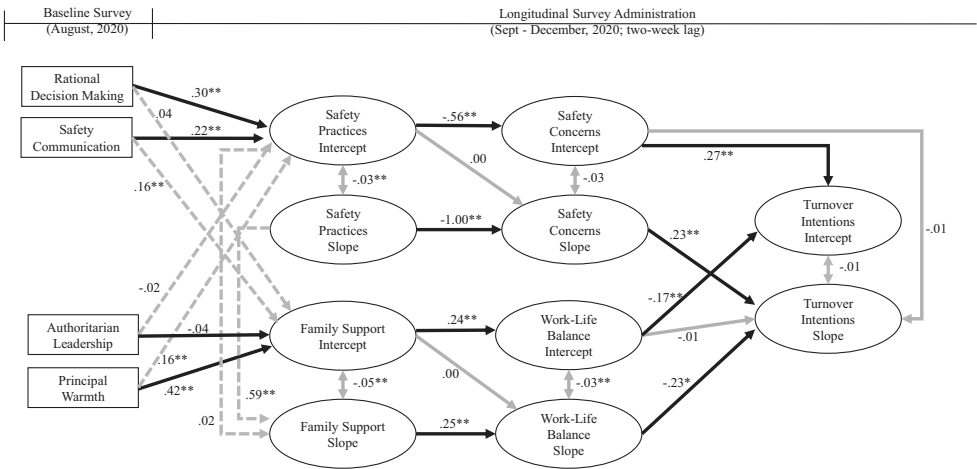


FIGURE 3 Unstandardized direct effect parameter estimates from the final fitted LGM. Black lines represent hypotheses, grey lines represent constraints commonly applied in LGM. Note that this figure only summarizes primary direct effects, estimates for the entire model are reported in Table 4 with indirect effects reported in Table 5. Dotted lines from the exogenous baseline constructs reflect additional constraints in the model that were included to demonstrate incremental validity of our primary predictors. Dotted lines from safety practices intercept and slope to family support slope were included as part of the model fitting process. * $p < .05$; ** $p < .01$

effect; the slope of district safety practices incrementally predicted the slope of principal family support, even after controlling for the intercept of safety practices on the slope of principal family support. This effect is consistent with our underlying application of resource spirals (Hsee & Abelson, 1991) in that the safety practices gain spiral was related to the family support gain spiral (i.e., this is an example of a

TABLE 4 Unstandardized parameter estimates of the final latent growth model

Parameter	Safety comm.	Author. leadership	Warmth	Safety practices int.	Safety practices slope	FS int.	FS slope	Safety concerns slope	WLB int.	WLB slope	TOI int.	TOI slope
Rational decision-making	.58**	-.09	.18**	.30**	.00	.04	-.01					
Safety communication		-.09	.17**	.22**	-.01	.16**	.00					
Author. leadership			-.86**	-.02	-.01	-.04	-.01					
Warmth				.16**	-.01	.42**	-.01					
Safety practices int.					-.03**	.17**	.02	.00	.12**			
Safety practices slope						.59**	-1.00**					
FS intercept							-.05**		.24**	.00		
FS slope										.25**		
Safety concerns int.				-.56**		-.02		-.03	-.13**		.27**	-.01
Safety concerns slope												.23**
WLB INT.										-.03*	-.17**	-.01
WLB slope												-.23*
TOI int.												-.01

Abbreviations: Int., Intercept; Author., Authoritarian; FS, Family support; WLB, Work-life balance; TOI, Turnover Intentions. * $p < .05$; ** $p < .01$.

resource caravan; Hobfoll et al., 2018). The re-estimated model demonstrated acceptable fit [$\chi^2(921) = 1648.49, p < .001, CFI = .889, RMSEA = .033$ (90% CI = .033, .038), SRMR = .075] and fit incrementally better [$\Delta\chi^2(2) = 26.68, p < .01$]. Thus, we report unstandardized parameter estimates from the revised model in Table 4 (also in Figure 3). Table 5 reports unstandardized indirect effects based on a bootstrap analysis of 5000 samples.

Results in Table 4 demonstrate that H1a and H2a were supported; district rational decision-making ($\gamma = .30, p < .001, SE = .043$) and safety communication ($\gamma = .22, p < .001, SE = .052$) predicted district safety practices at the beginning of the semester, even after accounting for principal authoritarian leadership ($\gamma = -.02, p = .725, SE = .044$), and principal warmth ($\gamma = .16, p < .001, SE = .044$). H1b and H2b were not supported; district rational decision-making ($\gamma = .00, p = .950, SE = .009$) was neither related to increases in district safety practices, nor was district safety communication ($\gamma = -.01, p = .307, SE = .011$). H3 was fully supported; district safety practices at the beginning of the semester negatively related to safety concerns at the beginning of the semester ($\gamma = -.56, p < .001, SE = .060$). Also, greater increases in district safety practices related to greater decreases in safety concerns ($\gamma = -1.00, p < .001, SE = .169$). H4 was fully supported; safety concerns at the beginning of the semester positively related to turnover intentions at the beginning of the semester ($\gamma = .27, p < .001, SE = .054$), and greater decreases in safety concerns related to greater decreases in turnover intentions ($\gamma = .23, p < .002, SE = .076$). Per Table 5, H5a was supported; district rational decision-making had an indirect effect of $-.05$ ($p = .001, SE = .014$) on turnover intentions at the beginning of the semester, and district safety communication had an indirect effect of $-.04$ ($p = .002, SE = .012$). However, H5b was not supported; district rational decision-making did neither have an indirect effect on changes in turnover intentions ($\gamma = .00, p = .693, SE = .003$), nor did district safety communication ($\gamma = .00, p = .376, SE = .003$).

Per Table 4, H6a was supported whereas H7a was not; principal warmth ($\gamma = .42, p < .001, SE = .046$) incrementally predicted principal family support at the beginning of the semester, after accounting for district rational decision-making ($\gamma = .043, p = .337, SE = .045$) and safety communication ($\gamma = .16, p = .003, SE = .055$), principal authoritarian leadership did not ($\gamma = -.04, p = .420, SE = .046$). H6b and H7b were not supported; principal warmth ($\gamma = -.01, p = .567, SE = .010$) was neither related to changes in principal family support, nor was principal authoritarian leadership ($\gamma = -.01, p = .397, SE = .010$). H8 was supported; family support at the beginning of the semester was positively related to work-life balance at the beginning of the semester ($\gamma = .24, p < .001, SE = .049$), and greater increases in family support related to greater increases in work-life balance ($\gamma = .25, p = .005, SE = .087$). H9 was fully supported; work-life balance at the beginning of the semester negatively related to turnover intentions at the beginning of the semester ($\gamma = -.17, p = .006, SE = .062$), and greater increases in work-life balance related to greater decreases in turnover intentions ($\gamma = -.23, p = .018, SE = .098$). H10a was partially supported; principal warmth had an indirect effect of $-.04$ ($p = .001, SE = .012$) on initial turnover intentions; the indirect effect of $.00$ ($p = .634, SE = .008$) for principal authoritarian leadership was not significant. Finally (Table 5), H10b was not supported; principal warmth did neither indirectly predict changes in turnover intentions ($\gamma = .00, p = .440, SE = .005$), nor did authoritarian leadership ($\gamma = .00, p = .330, SE = .003$).

DISCUSSION

Previous occupation-specific guidelines, crisis management, and turnover research offer little guidance on how front-line and senior leaders can retain teachers during an external, on-going, landscape-scale crisis like COVID-19. Using a dynamic application of resource theory (Hobfoll et al., 2018), we apply a leadership framework specific to COVID-19 (McKinsey & Company, 2020) to address these gaps.

⁹While the RMSEA and SRMR indices meet standard cutoffs, the CFI is below traditional cutoffs (Hu & Bentler, 1999). However, scholars have consistently noted that CFI can be highly sensitive for data with a large sample size, and have argued that diagnosis of model fit should rely on a holistic evaluation from every index (e.g., Lai & Green, 2016) including support for proposed hypotheses (Marsh et al., 2004).

TABLE 5 Unstandardized indirect effects from final empirical model (bootstrapped with 5000 samples)

Predictor	Outcome	Effect	SE
Rational decision-making	Safety Concerns (Intercept)	-.16**	.028
Safety communication	Safety Concerns (Intercept)	-.12**	.032
Principal warmth	Safety Concerns (Intercept)	-.09**	.027
Principal authoritarian leadership	Safety Concerns (Intercept)	.01	.026
Rational decision-making	Work-Life Balance (Intercept)	.010	.011
Safety communication	Work-Life Balance (Intercept)	.04**	.015
Principal warmth	Work-Life Balance (Intercept)	.10**	.024
Principal authoritarian leadership	Work-Life Balance (Intercept)	-.01	.012
Rational decision-making	Turnover Intentions (Intercept)	-.05**	.014
Safety communication	Turnover Intentions (Intercept)	-.04**	.012
Principal warmth	Turnover Intentions (Intercept)	-.04**	.012
Principal authoritarian leadership	Turnover Intentions (Intercept)	.00	.010
Safety practices (intercept)	Turnover Intentions (Intercept)	-.15**	.041
Principal FS (intercept)	Turnover Intentions (Intercept)	-.041	.022
Rational decision-making	Safety Concerns (Slope)	.00	.010
Safety communication	Safety Concerns (Slope)	.01	.011
Principal warmth	Safety Concerns (Slope)	.01	.009
Principal authoritarian leadership	Safety Concerns (Slope)	.01	.009
Rational decision-making	Work-Life Balance (Slope)	.00	.003
Safety communication	Work-Life Balance (Slope)	.00	.003
Principal warmth	Work-Life Balance (Slope)	.00	.005
Principal authoritarian leadership	Work-Life Balance (Slope)	.00	.003
Rational decision-making	Turnover Intentions (Slope)	.00	.003
Safety communication	Turnover Intentions (Slope)	.00	.003
Principal warmth	Turnover Intentions (Slope)	.00	.003
Principal authoritarian leadership	Turnover Intentions (Slope)	.00	.003
Safety practices (Slope)	Work-Life Balance (Slope)	.14*	.070
Safety practices (Slope)	Turnover Intentions (Slope)	-.27*	.120
Principal FS (slope)	Turnover Intentions (Slope)	-.06	.059

* $p < .05$; ** $p < .01$.

Further, we use LGM to examine how these leader actions affect teacher experiences and turnover intentions at the start of the Fall 2020 semester as well as changes in these experiences and turnover intentions during the semester. As we elaborate below, results provide theoretical and practical insight into the dynamic nature of crises, the importance of examining them in real time, and the behaviours and resources from leaders that may curb attrition in crises. Our findings may provide a framework for leadership during future crises, and—given varied vaccination rates, infection rates, and restriction practices still occurring around the world—could guide on-going support for teachings in areas where the threat of COVID-19 remains a salient part of daily life.

Theoretical and research implications

Our research contributes to occupational health, crisis management, and turnover research in several ways. First, we answer calls to understand leadership during crisis by identifying (a) the role different

levels of organizational leaders play (Bundy et al., 2017) and (b) the particular leader behaviours that set the stage for employees' initial crisis response or their spirals over the course of a crisis (Williams et al., 2017). Our design (eight lags plus a baseline assessment) and analytic approach (LGM) demonstrate that district *and* school leadership provide unique and complementary resources, but leader behaviours that shape initial crisis responses do not, contrary to theory (Hobfoll et al., 2018), similarly affect employee responses during crisis.

First considering initial crisis responding, district decision-making and safety communication do in fact contribute to lower initial turnover intentions through better perceptions of district safety practices and reduced teacher safety concerns at the start of the semester, as hypothesized. Similarly, principal warmth (i.e., an aspect of empathy; McKinsey & Company, 2020) contributed to lower initial turnover intentions through better initial perceptions of principal family support and work-life balance. Thus, we point to rational decision-making and safety communication by districts and warmth from school principals as clear, evidence-based, early actions from each leadership level that seem to aid initial retention. Unexpectedly, when accounting for other leader actions, principal authoritarian leadership was neither incrementally related to teacher perceptions of family support, work-life balance, nor initial turnover intentions. Post-hoc analyses (available upon request) suggest that principal authoritarian leadership relates to teacher perceptions of these constructs when warmth is excluded (principal warmth and authoritarian leadership correlate at $-.58$; Table 2). Collectively then, while more research seems warranted, it may be that authoritarian leadership drives turnover intentions *as a function* of a reduced display of warmth.

Beyond initial crisis responding, teachers' crisis response trajectories were triggered by continued resource provision by leaders over the semester, *not* initial leader actions. Specifically, increasing provision of valued resources by districts (i.e., continued refinement of safety practices) and principals (i.e., improved family support) as the crisis unfolded prevented turnover intentions from spiralling throughout the crisis. In this way, these results suggest that leader actions (at the start of the semester) set the starting points (intercepts) of employee crisis response trajectories, but leaders must vigilantly improve employee experiences (e.g., work-life balance) and continually provide key resources as the crisis develops to facilitate positive adjustment over time. From a theory perspective then, when applying the concept of gain spirals, our results suggest scholars may need to differentiate between what predicts individual starting points (intercepts) and what is related to change trajectories (i.e., slopes) beyond the influence of the starting levels.

This pattern of result does, however, correspond with the unfolding model of turnover, which states that shocks at work lead to turnover when employee needs (i.e., safety and work-life balance) are not met (Lee et al., 1999). Using a rigorous study design that corresponds with the unfolding nature of the model, our results suggest the model generalizes beyond shocks from internal organizational change to an on-going global pandemic. Specifically, we find that when safety concerns escalate or work-life balance declines, these spirals related to these key needs drive spirals in turnover during the COVID-19 crisis.

We also answer calls to consider crisis as a process that incites dynamic and unique responses, rather than as a static event (Bundy et al., 2017). We found that regardless of leader behaviours, teachers showed slightly increased work-life balance and decreased turnover intentions over the semester, which may align with theory on adaptation suggesting people return to a baseline, functional state after negative events (e.g., Diener et al., 2006). However, not everyone adjusted equally well during crisis (i.e., there is significant variability around these slopes; Table 3), and systematically changing work experiences pertaining to employee needs during the crisis (safety, work-life balance) shape individual trajectories in turnover intentions. Thus, crisis management theory and research should continue to incorporate temporal dynamics and identify factors that contribute to crisis response trajectories, using designs and analyses that allow for examination as crises unfold in real time, as done here.

Practical implication for school districts

District leaders should engage in rational decision-making, communication, and safety practice implementation

To meet teacher safety needs and minimize turnover in early stages of a crisis, district leadership should engage in rational decision-making that is visible to teachers. As the health crisis continues and district leaders must make decisions in the coming years, they can continue to consider scientific guidelines for COVID-19 safety (e.g., Center for Disease Control and Prevention), consult local health experts, and continue to consider new information, evaluate alternatives, monitor results, and adapt as needed. The composition of decision-making teams can also be targeted. In groups, decision-making processes may be hindered by insulation, homogeneity, and lack of strict decision-making procedures (Janis, 1982; Schafer & Crichlow, 1996). A diverse group of stakeholders connected to distinct parts of the district may facilitate collection of important data and rational analysis. To foster awareness of decision processes, districts might conduct brief, non-invasive, periodic surveys, provide regular reports that summarize results, and explain plans for action and how decisions were made. It is critical that these efforts are repeated frequently given that continued improvements to safety practices, rather than an effective initial safety plan alone, seemingly facilitate decreased safety concerns and turnover intentions as a crisis progresses. Beyond the pandemic, districts should continue to use rational decision-making processes that are transparent to teachers, especially in times of stress, to help manage teacher turnover intentions.

Principals should respond with warmth and engage in family support

Our findings suggest warm, empathetic front-line leadership, rather than mere lack of authoritarian or 'command and control' leadership, provides the resources (i.e., family support and work-life balance) teachers need and shapes their intentions to quit early in a crisis. Further, employers should work to continually increase and improve family support over the course of a crisis to foster employees' crisis response trajectories and limit turnover. In this and future crises, we suggest leaders consider the role of empathetic, family-supportive leadership and implement evidence-based training for these skills (Odle-Dusseau et al., 2016) as means to help manage important organizational issues, like employee retention. Moving forward, schools may consider changing selection systems to favour principals high in emotional intelligence (Fernández-Abscal & Martín-Díaz, 2019), a trait commonly related to warm, empathetic leadership. To ensure improvements to family support throughout a crisis and corresponding employee resource gain spirals, feedback, potentially from superiors and followers, should be solicited repeatedly (Tracey et al., 1995) to assess whether the warmth targeted in selection and training are effectively implemented.

Limitations

Our results must be interpreted in the context of their limitations (Brutus et al., 2013). First, the 54.2% retention rate suggests that a considerable proportion of participants did not complete at least two of the eight follow-up surveys. Although our attrition analysis suggests systematic differences are unlikely, other variables may have affected participation. Second, to manage retention, we used single-item measures. Although our scale validation suggests our measures are valid, some conceptually relevant aspects of the constructs may not have been captured (Fuchs & Diamantopoulos, 2009). To this end, other conceptual explanatory mechanism, beyond safety concerns and work-life balance (e.g., justice perceptions, well-being), may help explain turnover intentions trajectories. Though our data were collected in

the United States and the levels of some of the variables may be context-specific, such as how school districts are organized and who makes policy decisions, the underlying principles remain and are likely to apply globally. That is, having on-going communication and effective decision-making are likely widely relevant and applicable actions for leaders.

Additionally, unlike the teacher response variables, district and school leader behaviours were only assessed at the baseline and all constructs were assessed with self-report measures. Our focus on early leader behaviours is grounded in theoretical assertions from the crisis management literature (Drabek & McEntire, 2003) and COR theory (Hobfoll, 1989) that initial reactions may exert a lasting influence. In our results, baseline leadership sets starting points for safety practices and family support, which, as they develop, predict turnover intentions change over time. Given evidence that leader behaviours are dynamic (e.g., Johnson et al., 2012) including over various stages of a crisis (Williams et al., 2017), dynamic measurement of leader behaviours in future research would more completely capture leader responses to crises and may better predict employee changes as well.

Conclusion

Integrating the occupational health, crisis management, and turnover literatures, our research highlights several school and district leader actions that effectively support and retain teachers throughout this landscape-scale crisis. Initial turnover intentions can be targeted via rational decision-making and safety communication from senior leaders (districts) and empathy from front-line leaders (principals), as they provide teachers resources needed to feel safe and balance life roles. Although these initial leader responses are a crucial starting point, they alone are not sufficient in helping employees adaptively respond to a crisis over time. Continued and increasing provision of safety and work-life resources by leaders is needed to reduce teachers' desire to quit as the crisis progresses.

AUTHOR CONTRIBUTIONS

Russell A. Matthews: Conceptualization; data curation; formal analysis; investigation; methodology; project administration; supervision; validation; visualization; writing – original draft; writing – review and editing. **Julie H. Wayne:** Conceptualization; visualization; writing – original draft; writing – review and editing. **Claire Smith:** Conceptualization; formal analysis; investigation; methodology; visualization; writing – original draft; writing – review and editing. **Wendy J. Casper:** Conceptualization; visualization; writing – original draft; writing – review and editing. **Yi-Ren Wang:** Conceptualization; formal analysis; visualization; writing – review and editing. **Jessica Streit:** Conceptualization; data curation; investigation; methodology; project administration; supervision; visualization; writing – original draft; writing – review and editing.

CONFLICT OF INTEREST

All authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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