

Assessing safety culture in child welfare: Evidence from Tennessee



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ABSTRACT

States continue to search for ways to prevent harm to children and families within the child welfare system. Recently, states and researchers alike have looked to other high hazard sectors that have experienced harm-free performance by creating and sustaining a strong safety culture – an organizational focus and priority on safety. Safety culture is enabled by leader actions to prioritize safety (safety climate) and make it safe for employees to take an interpersonal risk (psychological safety). Safety culture is enacted by behaviors for detecting and correcting errors and unexpected events (safety organizing) and recognizing how stress affects work performance (stress recognition). However, despite their conceptual relevance and practical promise for child welfare, these and other safety culture constructs have yet to be subjected to rigorous empirical analysis in child welfare. This study draws on 1719 employees in the state of Tennessee's child welfare system to examine whether safety culture can be reliably and validly measured, can characterize organizations across a state (i.e., employees have shared perceptions of the safety culture), and be linked to relevant outcomes (e.g., employee emotional exhaustion). Our results confirm that components of safety culture can be reliably and validly measured in child welfare, perceptions of culture are shared within each of the Tennessee child welfare system's twelve regions, and that safety culture is generally associated with lower levels of employee emotional exhaustion, but also indicate that there is considerable opportunity for improvement as the levels of safety culture are low relative to other sectors.

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1. Introduction

Child welfare agencies are charged with keeping vulnerable children safe. The scope of this responsibility is substantial (U. S. Government Accountability Office, 2011). For example, in 2013 child welfare agencies across the United States received an estimated 3.5 million referrals of abuse and neglect involving over 6 million children with over 1,500 of those referrals resulting in child fatalities due to abuse and neglect (U. S. Department of Health and Human Services, 2015). In addition, during any 12-month period, up to 50% of children in foster care experience the less fatal, but significantly traumatic disruption from their placements and have to be moved to another home or to a more restrictive setting (Smith, Stormshak, Chamberlain, & Whaley, 2001). The magnitude and frequency of harm in child welfare indicates that threats are always present (Rzepnicki et al., 2010). Failures in the child welfare system, be they fatalities or instances where a child is not removed from a home where he or she is later harmed, often generate significant media attention and public outrage that threaten the reputation

and funding of agencies (Cull, Rzepnicki, O'Day, & Epstein, 2013; Gainsborough, 2009; Green & Tumlin, 1999; Rzepnicki et al., 2010).

Problems of harm persist in child welfare, in part, because it is an especially difficult context for change. Change is hard due to the concatenation of multiple factors. First, resources are increasingly scarce in child welfare as agencies face budget cuts and being forced to do more with less (Zell, 2006) while simultaneously experiencing greater media and public scrutiny and criticism (Chenot, 2011). Public outcry and scrutiny often results in child welfare agencies reacting defensively (Gambrill & Shlonsky, 2001; Orr, 1999) such that active reflection, problem-solving, and learning fail to occur (Committee on Ways and Means, 2012; Lachman & Bernard, 2006; Rzepnicki et al., 2012). In other words, child welfare agencies become rigid and risk-averse in order to minimize low-probability, high cost outcomes like child deaths (Macdonald & Macdonald, 2010). Second, child welfare workers experience these resource and structural conditions as high levels of job pressure with heavy and increasing workloads, often with life and death stakes (Barak, Nissly, & Levin, 2001; Rzepnicki et al., 2010; Tham & Meagher, 2009). An overwhelming workload coupled with inadequate training and staffing (Barth, Lloyd, Christ, Chapman, & Dickinson, 2008) further inhibits change to meet the pressing problems in child welfare. Third, Yamatani, Engel, and Spejeldnes (2009) find that heavy caseloads are often accompanied by significant pressure to process cases quickly.

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High production pressure and otherwise difficult working conditions also pose significant threats to child safety by inducing child welfare employees to make faulty judgments, exhibit inflexible thinking, and become behaviorally and cognitively rigid (McGee, 1989; Stevens & Higgins, 2002). More specifically, poor working conditions can result in cursory assessments, during a child welfare caseworker's initial meeting with a family, of threats to child safety or a family's ability to protect a child from those threats (Orsi, Drury, & Mackert, 2014).

Current risk and safety approaches intending to address persistent harm and difficult working conditions in the child welfare systems have tended to be piecemeal and lacking a comprehensive, systemic approach (Pecora, Chahine, & Graham, 2013). To find more systemic approaches to reducing persistent harm and breaking through difficult barriers to meaningful change, child welfare researchers have called for emulating other sectors ranging from aviation to health care that face similar complexity, risk, and high consequence decision-making and manage these conditions in a nearly harm-free manner (Cull et al., 2013; Munro, 2005; Rzepnicki et al., 2010). More specifically, the U.S. Department of Health and Human Services – Administration for Children, Youth and Families, U.S. Centers for Disease Control and Prevention, and the Casey Family Programs have all called for replicating the results other high-hazard sectors by strengthening the safety cultures of child welfare agencies (Committee on Ways and Means, 2012). More recently, the Commission to Eliminate Child Abuse and Neglect Fatalities (CECANF) reinforced the related calls for child welfare agencies to focus on creating safety cultures (CECANF, 2016). In fact, the final CECANF report specifically recommends funding pilot projects to evaluate the use of safety science in child protection and the use of safety culture measures (i.e., measures of the workforce, management, and supervision informed by safety science) in states' federally-mandated Child and Family Services Reviews (CSFRs) (CECANF, 2016).

Safety culture is the extent to which an organization and its members' values, attitudes, and behaviors align to focus their attention and effort on safety and pursuing reliable, harm-free operations (Vogus, Sutcliffe, & Weick, 2010). In other words, a safety culture emerges within an organization, but applies to the services it provides and the constituencies it serves. Prior research suggests that leaders successfully enable safety culture through behaviors and practices that place priority on safety (i.e., safety climate) and make it safe for individuals to speak up (i.e., psychological safety) (Vogus et al., 2010). Frontline employees successfully enact a safety culture when they engage in behaviors and processes that proactively detect and correct the unexpected (i.e., safety organizing) and monitor themselves, their peers, and the service delivery system for signs of stress (i.e., stress recognition) (Singer & Vogus, 2013; Vogus et al., 2010). In child welfare, enabling a safety culture entails efforts to broaden and sharpen thinking regarding safety and risk assessment (Pecora et al., 2013). Enacting safety culture means moving beyond identifying high-risk situations to more effective interventions and ongoing support (Pecora et al., 2013).

Pursuing safety culture as a means of reducing harm in the child welfare system raises important questions regarding the costs and efficacy of doing so. Specifically, given the extremely high levels of emotional exhaustion – feeling emotionally depleted and overextended (Maslach & Jackson, 1981) – experienced by child welfare employees (e.g., Anderson, 2000; Kim, 2011), does safety culture increase demands and worsen emotional exhaustion or help front line employees cope with their difficult work? Looking to the effects of safety culture on employees is essential because a safety culture relies on frontline employees like caseworkers to enact and refine it. In other words, enacting a strong safety culture is especially cognitively and emotionally effortful and demanding (Schulman, 1993). However, emotional exhaustion is a function of employee ability or inability to obtain and retain valued resources (Hobfoll & Freedy, 1993). Safety culture may in the form of safety climate provide a form of supervisory support (Lizano & Barak, 2012) and in the form of safety organizing higher quality work relationships (Zeitlin, Augsberger, Auerbach, & McGowan, 2014) both of which

have been associated with lower levels of emotional exhaustion and reduced turnover (Claiborne et al., 2011). Thus, exploring the safety culture – emotional exhaustion relationship provides an important initial test of whether safety culture is beneficial to or costly for child welfare workers.

Although there is a strong conceptual and empirical base regarding the value of safety culture in other industries and increasing calls for safety culture as a potential solution to persistent harm in child welfare systems, there is little direct empirical evidence regarding the applicability of safety culture to child welfare. Thus, we start with an attempt to assess the applicability of safety culture concepts in child welfare. In other words, do the findings of other high-hazard industries like health care delivery replicate in a similarly complex, high hazard (Rzepnicki et al., 2010), and morally ambiguous (e.g., Hasenfeld, 2009) child welfare system? Therefore, in this paper, we attempt to build an empirical foundation by answering a set of basic questions regarding safety culture in child welfare. First, can safety culture be reliably and validly measured in child welfare agencies? Second, how do observed levels of safety culture in child welfare compare to established benchmarks for assessing safety culture strength and with sectors with established records of harm-free operations? Third, are perceptions of safety culture shared within child welfare agencies? Lastly, in a test of predictive validity, does safety culture relate to an important outcome associated with harm in child welfare, employee emotional exhaustion (Armstrong & Laschinger, 2006; Boyas & Wind, 2010; Garrett, 2008; Glisson & Green, 2006; Halbesleben & Wheeler, 2011)? We answer these questions through a large survey study of employees in the Tennessee child welfare system in what we believe to be the first empirical safety culture study of child welfare employees.

2. Literature review

As noted above safety culture results from actions undertaken by leaders to enable it and by frontline employees to enact it (Singer & Vogus, 2013; Vogus et al., 2010). We describe two key ways by which leaders enable safety culture by prioritizing safety relative to other goals (i.e., safety climate, Zohar, 1980) and building psychological safety that encourages frontline workers to speak up and take interpersonal risks (Edmondson, 1999), ground them in child welfare work, and posit how they relate to emotional exhaustion. We then do the same for two ways in which frontline employees enact a safety culture by building capabilities for detecting and correcting errors and unexpected events (i.e., safety organizing, Weick & Sutcliffe, 2007) and how stress and fatigue affect work performance (i.e., stress recognition, Sexton, Helmreich, et al., 2006; Sexton, Holzmueller, et al., 2006).

To date, research in child welfare examining organizational culture's linkages to appropriate service delivery and employee outcomes has tended to focus on general characterizations of culture, such as the extent to which it is “constructive” (e.g., encouraging interactions and approaches that help staff meet their needs) (Glisson, Dukes, & Green, 2006; Glisson & Green, 2006, 2011; Spath, Strand, & Bosco-Ruggiero, 2013). Overcoming the persistent safety problems and barriers to improvement, however, requires a more specific and tailored approach. In other words, it requires a facet-specific approach to culture that emphasizes safety (e.g., Zohar & Luria, 2005). A facet-specific approach focuses on the organizational environment that shapes role behavior, that is, the extent to which certain facets of role behavior (e.g., safety) are rewarded and supported by an organization (Reichers & Schneider, 1990; Zohar & Luria, 2005).

2.1. Safety climate

Safety culture is enabled through safety climate or a specific set of leader actions including implementing safety-related procedures, giving safety highest priority (relative to other goals), broadly disseminating safety information, and otherwise working to assure safety (Naveh,

Katz-Navon, & Stern, 2005). These leader actions both serve as guides for employees regarding what the organization values and create a sense of efficacy that front line employees can cope with difficult circumstances (Hofmann, Morgeson, & Gerras, 2003). In other words, safety climate can help reduce emotional exhaustion by serving as a coping resource. Safety climate provides cognitive resources in the form of leader advice, guidance, and information to employees coping with difficult work conditions and adverse events like child deaths (Dekker, 2013). Additionally, a strong safety climate's focus on preventing adverse events and redressing difficult work conditions helps frontline workers feel supported and reappraise their work as a set of challenges to be overcome rather than sources of exhaustion (Dekker, 2013; Ullström, Sachs, Hansson, Øvretveit, & Brommels, 2014). The value of safety climate for employees and patients is evident in research from health care delivery linking safety climate to greater employee well-being (Profit, Sharek, Amspoker, et al., 2014; Profit, Sharek, Thomas, et al., 2014; Sexton et al., 2014) and reduced patient harm (Hansen, Williams, & Singer, 2011; Mardon, Khanna, Sorra, Dyer, & Famolaro, 2010; Singer, Lin, Falwell, Gaba, & Baker, 2009).

2.2. Psychological safety

Safety culture in child welfare relies on the expertise of frontline workers, specifically, reporting their assessments from engagement with children and families and offering suggestions that improve safety and child welfare (e.g., Kruzich, Mienko, & Courtney, 2014). Psychological safety is the shared belief that members of an organization are accepted, respected, and safe to take interpersonal risks (Edmondson, 1999). In other words, interpersonal consequences of well-intentioned risk will not be negative (Edmondson & Woolley, 2003).

In child welfare, the psychological safety of frontline workers is rooted in their perceptions of how leaders enable a safety culture by providing support and attend to the concerns of their employees (Kruzich et al., 2014). Psychologically safe teams are better able to access the expertise of their members leading to better decisions (Mazzocco et al., 2009), safer outcomes (Rathert, Ishqadeif, & May, 2009), and greater involvement in improvement activities (Nembhard & Edmondson, 2006). The provision of psychological safety from frontline child welfare workers to the children and families they serve is also essential as it allows them to heal, especially from experiences of abuse and violence (Jenney, Mishna, Alaggia, & Scott, 2014; Radford, Blacklock, & Iwi, 2006). Thus, when child welfare workers experience psychological safety it can enhance the safety of those they serve.

In creating the conditions for safer practice (i.e., enabling a safety culture), psychological safety allows front line child welfare workers to “do the right thing” and otherwise engage in good child protection practice, which helps coping with the difficult conditions in their work (Horton et al., 2014). A psychologically safe organization also provides a forum for acknowledging the difficulties faced by staff daily (Rzepnicki et al., 2010). Correspondingly, psychological safety has been linked to correlates of emotional exhaustion, namely lower levels of burnout, intentions to leave, and staff turnover in child welfare organizations (Barak et al., 2001; Dollard & Bakker, 2010; Kruzich et al., 2014).

2.3. Safety organizing

Effectively protecting children and increasing service quality in child welfare depends upon the work of front line staff assessing and managing risk (Munro, 2008). Safety culture is, in part, enacted through a set of frontline behaviors known as safety organizing (Vogus & Sutcliffe, 2007a; Weick & Sutcliffe, 2007). Specifically, safety organizing entails detecting and correcting errors and unexpected events by attending to “near miss” events and other leading indicators of harm, considering alternative, safer ways of carrying out work, continuous learning from errors, and deferring to frontline expertise to solve pressing problems (Weick & Sutcliffe, 2007). Prior research in health care delivery has

demonstrated the benefits of safety organizing to reducing harm (Vogus & Sutcliffe, 2007a,b).

The behaviors of safety organizing are evident in child welfare. Use of tools like Parent Daily Report attempt to assess early indicators of danger and harm before they occur (Chamberlain et al., 2006; U. S. Government Accountability Office, 2011). Safety organizing is evident when child protection investigators correct for oversimplifications frequently identified in cases of serious injury or death (Office of the Inspector General, 2007). Specifically, they may extend an investigation beyond the expected time until closure to revisit facts that appear to be of questionable credibility, more fully considering multiple risks gathered on a family (e.g., presence of domestic violence or parental mental health issues), or talking with additional sources (Rzepnicki et al., 2010). At a state level the Illinois Error Reduction Initiative re-examines child death investigations over the prior 10 years to identify organizational weaknesses and more effective prevention strategies (Rzepnicki et al., 2010). Front line child welfare workers also engage in safety organizing when they consult coworkers, the child protection team, or professionals with special expertise on the problem at hand when working a difficult case.

In working to reduce errors and unexpected events, safety organizing also helps resolve specific threats that may be especially exhausting to frontline child welfare employees. When engaging in safety organizing and reducing dangerous conditions employees are more likely to experience challenging conditions in their work as energizing rather than exhausting (Bellé, 2013). Collective attention on unsafe conditions and prior adverse events through safety organizing helps frontline employees feel supported (Dekker, 2013; Ullström et al., 2014) and less likely to experience emotional exhaustion (Vogus, Cooil, Sitterding, & Everett, 2014).

2.4. Stress recognition

Long work hours, on-call duties, crisis management responsibilities, repeated exposures to families in crisis and abuse and neglect of children may place child welfare workers at risk for both personal emotional exhaustion and stress- and fatigue-related adverse events (Barak et al., 2001). Stress recognition entails understanding how such stress and fatigue affects work activities, including decision-making (Sexton, Helmreich, et al., 2006; Sexton, Holzmüller, et al., 2006), especially when engaging in critical thinking under difficult conditions (Caldwell, 2005; Cannon-Bowers & Salas, 1998). Enacting a safety culture relies upon a well-developed capacity for detecting early signs of personal and organizational stress and in turn facilitating swifter corrective action. For example, in hospital intensive care units, earlier recognition of how stress was degrading work performance led their members to request additional resources (i.e., staffing) to restore performance and reduce exhaustion (Sexton, Helmreich, et al., 2006; Sexton, Holzmüller, et al., 2006). In child welfare there has been a corresponding push toward “trauma-informed care” that prioritizes recognizing and understanding the effect that trauma exposure has on children, families, and workers (Pynoos et al., 2008). Stress recognition and trauma-informed self-care helps mitigate emotional exhaustion through a combination of enhancing awareness of one's own emotional experience in response to exposure to traumatized clients and responding with positive coping strategies such as seeking assistance from a supervisor or peer, attending trainings on secondary trauma and work-life balance (Salloum, Kondrat, Johnco, & Olson, 2015).

3. Materials and methods

3.1. Sample and data collection

We conducted an anonymous, cross-sectional survey of staff in the Tennessee Department of Children's Services from September to October 2013 as part of a quality improvement effort aimed at workforce

development. Subsequent use of this information for research purposes was approved by the Vanderbilt University Institutional Review Board.

Located in the Southeastern U.S. geographical census region, Tennessee is a state with an estimated 2014 total population of 6.5 million people (U.S. Census Bureau, 2015). The Tennessee Department of Children's Services is the agency with responsibility for the state's child welfare and juvenile justice systems. The Tennessee Department of Children's Services is organized into twelve regional service areas, all of which were included in this study. For each regional service area, the sample included all front-line case managers and their immediate supervisors. Study data were collected and managed using the Research Electronic Data Capture (REDCap) system which is a secure, web-based electronic data capture tool hosted at Vanderbilt University (Harris et al., 2009). We were provided an email distribution list for all qualifying staff ($n = 2,433$) and received 1719 responses (70.6% response rate). Across the twelve regional service areas, response rates ranged between 56% and 84%.

While the overwhelming majority of respondents to our survey answered each question, there was a small amount of missing data. Hertel (1976) recommends that any given variable should have no > 15% missing data. Overall, for the variables of interest to our study (safety climate, psychological safety, safety organizing, stress recognition, and emotional exhaustion) there were 41 of 1719 observations (2.4%) missing data on at least one item of one variable. Safety climate had 15 (0.9%) missing observations, psychological safety had 8 (0.5%), safety organizing had 12 (0.7%), stress recognition had 3 (0.2%), and emotional exhaustion 4 (0.2%). The amount of missing data in the current study falls well below Hertel's 15% suggestion and the missing observations did not significantly differ from the overall sample in years worked, role, or region. Given the low rate of missing data and its representativeness we dropped the observations with missing data (cf. Salloum et al., 2015).

3.2. Measures

We measured four constructs considered important aspects of safety culture – safety climate, psychological safety, stress recognition, and safety organizing (Vogus et al., 2010) – by using and slightly rewording previously established, validated scales. Minor adaptations to scales were made to improve domain specificity. For example, use of healthcare-specific words like “nurse” and “patient” were changed to “case manager” and “child and family.” No substantive changes were made to the structure or content of scales. All scales were rated on a 7-point Likert type scale with negatively worded items reverse coded. We also measured emotional exhaustion using four items from the emotional exhaustion scale of the Maslach Burnout Inventory (Maslach & Jackson, 1981) and demographic control variables.

3.2.1. Safety culture constructs

3.2.1.1. Safety climate. We measured safety climate, defined as perceived organizational attributes related to safety including policies and practices, using items developed by Zohar (1980) that we adapted to fit the child welfare context. The safety climate measure gives an overall impression of the organization's commitment to safety. Our safety climate scale included 7 items. Sample questions include, “My supervisor approaches employees during work to discuss safety issues that affect our children and families” and “As long as there is no harm to children and families, my supervisor does not care how the work is done.” Internal consistency reliability for this scale in our sample (Cronbach's $\alpha = 0.85$) was consistent with previous research on the scale (Zohar, 1980).

3.2.1.2. Psychological safety. We measured psychological safety by using a slightly adapted (for domain specificity) previously-validated scale (Edmondson, 1999). Our psychological safety scale included 4 items.

Sample questions include, “If you make a mistake in our workgroup, it is often held against you” and “It is safe to take an interpersonal risk in our workgroup.” Internal consistency reliability for this scale in our sample (Cronbach's $\alpha = 0.79$) was consistent with previous research (Edmondson, 1999) including recent work in child welfare (Kruzich et al., 2014).

3.2.1.3. Stress recognition. To assess stress recognition we used the Safety Attitudes Questionnaire (Sexton, Helmreich, et al., 2006; Sexton, Holzmüller, et al., 2006). We did not need to make any adaptations to this scale which included 4 items. Sample questions include, “When my workload becomes excessive my performance is impaired” and “I am more likely to make mistakes in tense or hostile situations.” Internal consistency reliability for this scale in our sample (Cronbach's $\alpha = 0.84$) was consistent with previous research (Sexton, Helmreich, et al., 2006; Sexton, Holzmüller, et al., 2006).

3.2.1.4. Safety organizing. The construct of safety organizing captures the behavioral enactment of safety culture. To assess safety organizing we adapted the 9-item Safety Organizing Scale developed and validated by Vogus and Sutcliffe (2007a). The Safety Organizing Scale was created for use with hospital nursing staff and contained language specific to nursing and the process of managing patient flow that were changed to reflect the work child welfare staff. Sample questions include, “When giving a report to another employee, we usually discuss what to look out for” and “When errors happen my workgroup discusses how we could have prevented them.” Internal consistency reliability for this scale in our sample (Cronbach's $\alpha = 0.94$) was consistent with previous research on the scale (Vogus & Sutcliffe, 2007a,b).

3.2.2. Employee emotional exhaustion

We used four items from the emotional exhaustion scale of the Maslach Burnout Inventory (Maslach & Jackson, 1981). Items in this scale refer to respondents' state of emotional depletion from work including the extent to which an employee felt emotionally drained from work and the extent they felt used up at the end of the day (Cronbach's $\alpha = 0.93$). Examples of items include, “I feel emotionally drained from my work” and “I feel used up at the end of the work day.”

3.2.3. Control variables

In addition to our variables of interest, we also collected demographic data to assess the representativeness of our sample and to provide control variables in our analysis of employee emotional exhaustion. The number of hours worked in a typical week was measured on a 0 to 3 scale with each number corresponding to one of four categories – 40 h or fewer (0), 41–49 h (1), 50 to 59 h (2), and 60 h or more (3). Professional experience in child welfare was measured on a 0 to 3 scale with each number corresponding to one of four categories of the number of years working in child welfare – < 1 year (0), 1 to 5 years (1), 6 to 10 years (2), and 11 or more years (3). Current role was measured on a 0 to 3 scale with each number corresponding to one of four categories – supervisor (0), child protective services (1), child welfare (2), and juvenile justice (3). Lastly, we measured whether each individual worked in an urban region (dummy variable, 1 if urban, 0 otherwise).

3.3. Analysis

We used five sets of analyses to determine the validity and value of assessing safety culture in child welfare. First, we engaged in descriptive analysis of the components of safety culture in comparison to normative benchmarks from organizations exhibiting strong safety culture (e.g., Gaba, Singer, Sinaiko, Bowen, & Ciavarelli, 2003). Specifically, following prior research in industries including naval aviation (Gaba et al., 2003) and health care (Singer et al., 2003, 2009), we examined responses to survey questions that indicate the absence of attitudes and

experiences reflective of a culture of safety (for relevant reviews in health care see [Singer & Vogus, 2013](#); [Vogus et al., 2010](#)). Such “problematic responses” (lower than or equal to 3 on a 1 to 7 scale) are found to be almost absent (10% or less) in organizations with a strong safety culture. Low levels of problematic responses are deemed essential in a strong safety culture because such a culture is a function of shared perceptions of a high level of a safety culture (e.g., 7 on a 7 point scale). Problematic responses are inimical to perceptions of a strong safety culture because they lower the level and weaken the extent to which perceptions are shared. Second, we evaluated the discriminant validity of the components of safety culture to assure each captured a unique aspect of safety culture using confirmatory factor analysis (CFA). Third, given that safety culture is grounded in shared perceptions, we conducted multiple analyses of region-level differences and within region agreement including a one-way ANOVA of each component of safety culture (e.g., safety climate) with region as the independent variable, two forms of intraclass correlation (i.e., ICC[1] and ICC[2], [Bliese, 2000](#)) and rwg ([James, Demaree, & Wolf, 1984](#)) to determine the extent to which perceptions of the components of safety culture were actually shared within regions and whether individual survey responses could be aggregated to the region level. We discuss each of these four analyses in more detail below. Lastly, we conducted preliminary explorations of the linkages between the components of safety culture and an important outcome for those managing child welfare agencies – employee emotional exhaustion. We examined the linkage at the individual level using regression analysis and at the collective level, given the very small sample size, using Spearman rank correlations. CFA was conducted in AMOS 5.0 ([Arbuckle, 2003](#)) and all other analyses were conducted using Stata 13.1 ([StataCorp, 2013](#)).

4. Results

4.1. Sample demographic characteristics

As shown in [Table 1](#), of the 1719 survey responses we received, 21% were from supervisors, 30% were from child protective services workers, 10% were from juvenile justice workers, and 39% were from child welfare workers. 65% of responses were from staff in urban counties. 12% of respondents had been working in child welfare <1 year and 62% for 11 years or more. 19% of respondents had been in their current position <1 year and 35% for 11 years or more. 75% of respondents indicated that they worked >40 h per week.

Table 1
Sample demographic characteristics.

Variable	State (n = 1719)
Hours worked	
<40 h	431 (25.1)
40 to 49 h	899 (52.3)
50 to 59 h	318 (18.5)
60 h or more	71 (4.1)
Years in child welfare	
<1 year	213 (12.4)
1 to 5 years	444 (25.8)
6 to 10 years	474 (27.6)
11 years or more	588 (34.2)
Years in current position	
<1 year	328 (19.1)
1 to 5 years	778 (45.3)
6 to 10 years	410 (23.9)
11 years or more	203 (11.8)
Role	
Supervisor	354 (20.6)
Child protective services	522 (30.4)
Juvenile justice	170 (9.9)
Child welfare	673 (39.2)

4.2. Descriptive analysis of safety culture

[Fig. 1](#) depicts the percentage of problematic scores for each safety culture measure in comparison to the level (<10% of responses on a 1 to 7 scale at 3 or lower for a given region).

4.3. Discriminant validity

To assess the discriminant validity of the safety culture measures, we employed confirmatory factor analysis (CFA). Specifically, we conducted our analysis at the individual level ($N = 1719$). All items for each of the constructs (e.g., the nine items of mindful organizing) significantly loaded onto their respective construct ($p < 0.001$). A five-factor solution with all five variables (the four aspects of safety culture and emotional exhaustion) as distinct constructs demonstrated good fit to the data ($\chi^2 = 2615.09$, $df = 263$, $\chi^2/df = 9.94$; IFI = 0.93; CFI = 0.93; RMSEA = 0.072, SRMR = 0.048), and a significantly better fit than alternative models with fewer factors ($p < 0.001$; details are available from the authors). Thus, there was strong evidence of discriminant validity among safety culture concepts.

4.4. Statistical justification for aggregation

Safety culture is defined by shared perceptions of members of a collective (in this case a region). Thus, to assess safety culture in child welfare requires determining whether perceptions of safety culture and its components are idiosyncratic or shared. Perceptions are considered shared when it can be statistically demonstrated that 1) the members of each region reported similar scores for the region on a given measure and 2) the regions have significant between region variance for a given measure. Four complementary measures of within-group agreement were used to determine the degree of congruence between individual case managers and supervisors survey responses and the appropriateness of aggregating these measures to the region level: the median rwg(j) ([James et al., 1984](#)), the F-statistic from a one-way analysis of variance (ANOVA), and intraclass correlation coefficients ([Bliese, 2000](#); [LeBreton & Senter, 2008](#)).

Rwg(j) tests whether members in a case management region agreed in their responses to the four safety culture measures ([James et al., 1984](#)). A minimum rwg(j) value of 0.70 provides evidence that there is acceptable agreement among case managers and supervisors within a region to combine their responses into an aggregate region-level measure ([James et al., 1984](#)) and has been used in previous studies of organizational culture in child welfare agencies (e.g., [Glisson & Green, 2006](#); [Glisson & James, 2002](#)). Every safety culture measure had a median rwg(j) value >0.84 with emotional exhaustion having a median value of 0.71.

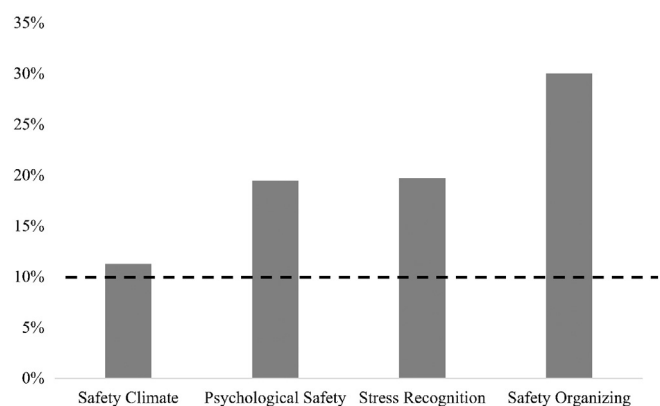


Fig. 1. Percent problematic responses for components of safety culture. Dashed line represents the maximum percent problematic responses observed in organizations characterized by a strong safety culture.

A significant F-statistic resulting from a one-way ANOVA with region as the independent variable and the safety culture measure as the dependent variable indicates that responses differ between employees in different regions. The one-way ANOVA of unit for the safety culture measures uniformly had a highly significant F-statistic ($p < 0.01$ for all measures except safety organizing which was significant at $p < 0.056$). The two forms of the intraclass correlation, referred to as ICC(1) and ICC(2) (Bliese, 2000), provide omnibus indices of homogeneity and are calculated from a one-way ANOVA in which the measure of safety culture is the dependent variable and region is the independent variable. ICC(1) can be interpreted as the proportion of total variance that is explained by region with values ranging from -1 to $+1$ and values between 0.05 and 0.30 being most typical and indicative of it being appropriate to aggregate individual employee responses to the region level. ICC(1) is computed as: $ICC(1) = MSB - MSW / MSB + [(k - 1) * MSW]$, where MSB is between-region mean square, MSW is within region mean square, and k is average region size. The ICC(1) values for the safety culture measures ranged from 0.21 to 0.38. Whereas ICC(1) provides an estimate of the reliability of a single employee's assessment of the region mean, ICC(2) provides an overall estimate of the reliability of region means. The ICC(2) is computed as $(MSB - MSW) / MSB$. The closer ICC(2) is to 1.00, the more reliably regions can be distinguished based on individual employees' perceptions of the measure of safety culture. Values equal to or above 0.70 are seen as acceptable for aggregating individual employee responses on measures of safety culture to the region level (Bliese, 2000; LeBreton & Senter, 2008) and have been commonly used to justify aggregating individual responses in studies of safety culture in related industries like health care (e.g., Hofmann & Mark, 2006; Sexton, Helmreich, et al., 2006; Sexton, Holzmueller, et al., 2006; Tucker, Nemhhard, & Edmondson, 2007; Vogus & Sutcliffe, 2007a). The ICC(2) values for the safety culture measures ranged from 0.97 to 0.99. In sum, the results of these four analyses (see Table 2 for additional details regarding aggregation statistics for each measure) strongly support the idea that the safety culture measures reflect region-level constructs and aggregation of individual responses is justified. Given this strong support, we created region-level measures as the average of all the individual employee responses.

4.5. Predictive validity – emotional exhaustion

Means, standard deviations, and correlations are shown in Table 3. The mean levels of the components of safety culture ranged from a low of 4.48 for safety organizing to a high of 5.04 for safety climate. To provide an initial test of the effects of four components of safety culture (and preliminarily assess the measures' predictive validity in a child welfare context) we explored their linkage with emotional exhaustion. We did so in two ways. First, we conducted multivariate linear regression with robust standard errors (Long, 1997) predicting individual emotional exhaustion at the individual level (see Table 4). Second, for the 12 regions, we conducted Spearman rank correlations (Gittell, 2000).

Table 2
Statistics supporting aggregation of safety culture variables.

Variable	rwg(j)	Intraclass correlation		F-test
		ICC(1)	ICC(2)	
Emotional exhaustion	0.71	0.21	0.97*	3.90***
Safety climate	0.87	0.31	0.98	2.34**
Psychological safety	0.84	0.24	0.98	3.33***
Stress recognition	0.84	0.21	0.97	4.01***
Safety organizing	0.90	0.38	0.99	1.74†

† $p < 0.10$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

In Model 2 we examined the relationship between the perceptions of two aspects of enabling safety culture and individual employee ratings of their emotional exhaustion and found safety climate ($B = -0.17$, $p < 0.001$) and psychological safety ($B = -0.23$, $p < 0.001$) were negatively and significantly associated with emotional exhaustion. In Model 3 we examined the relationship between the perceptions of two aspects of enacting safety culture and individual employee ratings of their emotional exhaustion and found safety organizing ($B = -0.08$, $p < 0.01$) was negatively associated with emotional exhaustion, but stress recognition was positively associated with employee emotional exhaustion ($B = 0.67$, $p < 0.001$). When all variables are entered simultaneously in Model 4, the results for safety climate ($B = -0.14$, $p < 0.001$), psychological safety ($B = -0.18$, $p < 0.001$), and stress recognition ($B = 0.64$, $p < 0.001$) all hold, but safety organizing has a positive, significant relationship with emotional exhaustion ($B = 0.06$, $p < 0.05$).

Due to the extremely small sample size the Spearman rank correlations are mostly suggestive, but they are directionally consistent with expectations and the regression analyses for safety climate ($r = -0.32$, n.s.), psychological safety ($r = -0.08$, n.s.), and safety organizing ($r = -0.53$, $p = 0.075$) with stress recognition being counter to expectations ($r = 0.88$, $p < 0.001$). We discuss these results, especially the counterintuitive findings further in the Discussion section.

5. Discussion

In response to recent calls for child welfare agencies (CECANF, 2016; Committee on Ways and Means, 2012; Cull et al., 2013; Rzepnicki et al., 2010) to embrace safety culture as a means of substantially reducing harm in the U.S. child welfare system, we have taken a first systematic attempt to assess safety culture within a single state's child welfare system. We drew upon leading models of safety culture (Etchegaray & Thomas, 2012; Singla, Kitch, Weissman, & Campbell, 2006; Vogus et al., 2010) to examine two factors enabling safety culture (safety climate and psychological safety) and two enacting safety culture (safety organizing and stress recognition) (Singer & Vogus, 2013; Vogus et al., 2010).

The results replicate earlier work regarding safety culture in health care and indicate that safety culture can be reliably and validly measured in child welfare. Consistent with the difficult work conditions in child welfare agencies, our results revealed that for most measures of safety culture we observed low means and, relative to organizations with strong safety cultures, high levels of problematic responses. However, these results also indicate that there is a significant opportunity for improving safety culture in child welfare and that doing so may have benefits for employees (lower levels of emotional exhaustion) as well as recipients of child welfare services.

Another noteworthy and promising finding was that perceptions of all the aspects of safety culture were substantially and significantly shared. In other words, unlike health care organizations where safety culture coheres at the unit rather than hospital level (Singer et al., 2009), in the child welfare system in Tennessee safety culture coheres within relatively large organizational units (i.e., regions). This is important because shared perceptions throughout a region indicate that the effects of interventions to enhance safety culture will likely spread widely, however, this requires empirical investigation. Our findings bolster evidence that enabling safety culture (i.e., interpretations of leader practices and priorities including safety climate and psychological safety) matters to critical outcomes, like emotional exhaustion, in social service work in general (Meyerson, 1994; Profit, Sharek, Amspoker, et al., 2014; Profit, Sharek, Thomas, et al., 2014) and in child welfare in particular (Ellett, Ellis, Westbrook, & Dews, 2007). This suggests that a leader's focus on safety and creating an environment where frontline staff can speak up regarding safety concerns with the intent to redress them can assist frontline child welfare workers cope with their difficult, and often exhausting, work. In other words, enabling a safety culture may act as a protective resource for frontline child welfare employees.

Table 3

Means, standard deviations, and correlations.

Variable	Mean	SD	1	2	3	4	5
Emotional exhaustion	4.16	1.42 [†]	(0.93)				
Safety climate	5.04	1.02 [*]	−0.23***	(0.85)			
Psychological safety	4.59	1.03**	−0.24***	0.49***	(0.79)		
Stress recognition	4.72	1.11	0.54***	−0.13***	−0.16***	(0.84)	
Safety organizing	4.48	1.11	−0.12***	0.40***	−0.60***	−0.11***	(0.94)

N = 1,719.

Note: reliabilities appear in parentheses along the diagonal.

[†] $p < 0.10$.^{*} $p < 0.05$.^{**} $p < 0.01$.^{***} $p < 0.001$.

Our research complements prior work linking more general measures of organizational culture (i.e., the extent to which it is constructive) and lower levels of employee emotional exhaustion and burnout (Boyas & Wind, 2010; Glisson & Green, 2006). Unlike this research (e.g., Glisson & Green, 2006), we drew from health care, high-reliability settings, and recent calls in child welfare to emulate these sectors (CECANF, 2016; Cull et al., 2013; Rzepnicki et al., 2010) to replicate and validate a facet-specific set of safety culture measures in child welfare and link them to employee emotional exhaustion. Thus, an important area of future research will be exploring the relationship between general, global assessments of organizational culture like constructive/destructive (e.g., Glisson & Green, 2006) and more focused facet-specific indicators like our measures of components of safety culture (e.g., Wallace, Popp, & Mondore, 2006) on child, family, and employee outcomes. It would also be useful to explore how safety culture interacts with safety-oriented practices and tools in child welfare like critical incident reporting (Brenner & Freundlich, 2006), safety planning (Murray & Graves, 2013), and signs of safety (Keddell, 2014; Pecora et al., 2013). We posit that well-developed practices of enabling and processes of enacting safety culture will increase the use of the tools and increase their efficacy for improving child welfare, but this requires further empirical work.

Our analyses of the frontline processes by which a safety culture is enacted produced some counterintuitive results. First, contrary to prior research and our expectations we found at both the individual and region level that stress recognition was associated with higher levels of emotional exhaustion. The strength of these findings seem to indicate that employees responding to the survey saw stress recognition not as a capability for coping, but rather an indication of the actual level of stress for themselves and those working in a given region. This suggests that interventions to reposition stress recognition as a capability through training as previously done in industries ranging from aviation

to health care (Gordon, Mendenhall, & O'Connor, 2012) or otherwise altering employee views of stress (e.g., stress mindset interventions, Crum, Salovey, & Achor, 2013) may be worthwhile.

Second, the findings related to safety organizing were also surprising and nuanced. We found that the bivariate correlation between safety organizing and emotional exhaustion was negative and significant, negative and significant in the regression model only including the enacting safety culture factors (safety organizing and stress recognition), and negative and significant at the $p < 0.10$ level in the Spearman rank correlations. However, when we also included the enabling safety culture factors (safety climate and psychological safety) the relationship between safety organizing and emotional exhaustion became positive (i.e., higher levels of safety organizing associated with higher levels of emotional exhaustion). The result does not appear to be a function of multicollinearity as the correlations among the variables are not problematically high nor are the variance inflation factors in the regression analysis. Thus, this surprising result merits additional consideration. Safety organizing reflects a context that grants frontline employees voice (Weick & Sutcliffe, 2007) and acts as a resource for handling difficult situations at work. This explains why when considered alone or in the absence of safety climate and psychological safety, safety organizing is associated with lower emotional exhaustion. However, safety organizing also imposes significant behavioral, cognitive, and emotional demands (Vogus et al., 2014). In settings like child welfare agencies where pre-existing emotional exhaustion is likely to be high and many other aspects of the work are especially difficult (e.g., high caseloads, insufficient resources, and complex, inherently unpredictable decisions made under time pressure) the discretionary (i.e., extra-role) demands of safety organizing may feel like extra work to already overburdened child welfare workers and be associated with higher emotional exhaustion. Thus, specific managerial or training interventions that illustrate

Table 4

OLS regression analyses of emotional exhaustion.

Model:	Dependent variable: emotional exhaustion			
	1	2	3	4
Constant	3.46 (0.11)***	5.51 (0.23)***	0.81 (0.20)***	1.94 (0.25)**
Hours	0.20 (0.04)***	0.15 (0.04)***	0.18 (0.04)***	0.14 (0.04)***
Years in child welfare	0.15 (0.03)***	0.13 (0.03)***	0.10 (0.03)***	0.08 (0.03)**
Role category	0.04 (0.03)	0.03 (0.03)	0.02 (0.02)	0.03 (0.02)
Urban	0.26 (0.07)***	0.23 (0.07)***	0.19 (0.06)**	0.17 (0.06)**
Safety climate		−0.17 (0.04)***		−0.14 (0.04)***
Psychological safety		−0.23 (0.04)***		−0.18 (0.04)***
Safety organizing			−0.08 (0.03)**	0.06 (0.03)*
Stress recognition			0.67 (0.03)***	0.64 (0.03)***
F	13.31***	23.81***	51.17***	67.74***
R ² overall	0.03	0.09	0.31	0.38
ΔR ²		0.06	0.28	0.35 [†]

N = 1,719; robust standard errors in parentheses.

ΔR² compared to model 1.[†] $p < 0.10$.^{*} $p < 0.05$.^{**} $p < 0.01$.^{***} $p < 0.001$.

how safety organizing may provide behavioral and conceptual resources that help reduce harm (Vogus & Sutcliffe, 2007a,b) by improving safety assessments through cross-checking thinking, learning from experience, and critically analyzing weak signals of potential harm (Pecora et al., 2013). The conditions under which this occurs merits further exploration.

Our findings should be considered in light of their limitations. First, it is a cross-sectional survey of child welfare workers in a single state; thus, our results may be specific to child welfare employees in Tennessee at the point in time at which they were surveyed. Future research should explore whether the patterns observed regarding the level of safety culture and its relationship to outcomes like emotional exhaustion generalizes to other states, especially states that have experimented with intervening to enhance safety culture and reduce harm in their child welfare system (e.g., Illinois, Rzepnicki et al., 2010). Second, although we found strong evidence of agreement among employees within regions, prior research suggests that aspects of safety culture like safety climate (Singer et al., 2003; Zohar, 1980), psychological safety (Edmondson, 1999; Nemhard & Edmondson, 2006), safety organizing (Vogus & Sutcliffe, 2007a,b), and stress recognition (Sexton, Helmreich, et al., 2006; Sexton, Holzmueller, et al., 2006) are likely to be stronger at more local levels of analysis (e.g., specific offices or teams within offices). Thus, future work should assess these measures at these levels of analysis and otherwise study their cultures.

Third, there are multiple potential limitations associated with survey research and our study including social desirability bias, selection bias, and measurement error. We believe social desirability bias is limited in our data as the means are consistent with to lower than other industries (e.g., health care), we observed lots of variation around the means, and we observed higher levels of problematic responses than observed in strong safety cultures (in health care) or high-reliability organizations (like naval aviation) (e.g., Gaba et al., 2003; Singer et al., 2003). If social desirability bias were a significant concern we would expect higher mean responses, lower variation in responses, and lower percent problematic responses. We believe selection bias is limited due to the relatively high response rate (over 70%) and representativeness of the sample, but further validation of safety culture in child welfare in other states and over time is warranted. Due to the rigorous psychometric validation of our survey instruments in child welfare and the consistency of our results with prior studies in health care suggests that measurement bias is of limited concern.

However, our analyses of emotional exhaustion could be affected by omitted variable bias as we were unable to account for a number of factors that have previously been associated with emotional exhaustion. Although an important limitation of the present study, it provides an opportunity for future research to examine, for example, the independent and joint effects of constructive organizational culture (Glisson & Green, 2006) and safety culture on emotional exhaustion. Similarly, future research should simultaneously explore the effects of safety culture and some of the many other organizational (e.g., supervisory support, Lizano & Barak, 2012) or work (e.g., high quality work relationships, Zeitlin et al., 2014; work family conflict, Lizano & Barak, 2015) factors previously associated with lower emotional exhaustion in child welfare contexts to ensure our results are robust.

Fourth, our measures of safety culture are not currently linked to other administrative data, namely safety outcomes for the recipients of child welfare services, limiting predictive validity testing. Therefore, future research should look into relationships with outcomes like placement disruptions (Chamberlain et al., 2006), multiple placements (Wulczyn, Kogan, & Harden, 2003), as well as child maltreatment and serious injury.

Last, our exploratory analyses of the linkage between the aspects of safety culture and emotional exhaustion had two important limitations. At the individual level, both the measures of safety culture and emotional exhaustion came from the same source (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). At the region level aggregating individual responses

ameliorates some concerns about same source bias, but our sample size was small (12 regions) and limited us to Spearman rank correlation analysis. Future work should address these limitations by measuring outcomes from different sources and increasing the sample size (by either studying smaller units like teams or getting a multi-state or even national sample).

Despite these limitations our research provides important initial empirical insights into safety culture in child welfare. Consistent with research in related industries like health care, safety culture can be reliably and validly measured within child welfare and that surveys also provide a coherent picture of a region's safety culture. Amidst the highly salient and vivid examples of failures of the child welfare system across the country, we find that leader actions to enable a safety culture that signify safety is a leadership priority (i.e., safety climate) and that it is psychologically safe for employees to speak up about challenging situations at work can help employees cope with their extremely difficult and intensely scrutinized work and experience lower levels of emotional exhaustion. However, we also illustrate opportunities for improvement as our data reveal that many aspects of safety culture are underdeveloped (e.g., stress recognition and safety organizing). Thus, we provide provisional evidence supportive of recent calls (CECANF, 2016; Cull et al., 2013; Rzepnicki et al., 2010) to strengthen safety culture within a state's child welfare agencies. In doing so, we replicate results from closely related domains (e.g., health care) and validate a set of safety culture measures that can be used to identify sources of strength and areas for development in creating and sustaining a culture of safety in child welfare. We hope others will join us in further refining these measures and exploring the antecedents and consequences of safety culture.

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