



Paradise Lost (and Restored?): A Study of Psychological Safety over Time

Journal:	<i>Academy of Management Discoveries</i>
Manuscript ID	AMD-2023-0084.R2
Manuscript Type:	Revision
Keywords:	Psychological Safety < Attitudes & Motivation, Longitudinal Data Analysis < Research Methods, Newcomer Socialization < Careers & Socialization, Multilevel Analyses (Cross and Multilevel) < Research Methods
Abstract:	<p>Although prior research indicates that psychological safety can fluctuate, questions about when and why remain. To gain insights into the emergence and temporal dynamics of psychological safety, we explored longitudinal data representing more than 10,000 health care workers. Using multilevel growth models, we discovered that clinicians with less than one year of service (i.e., newcomers) enjoyed higher psychological safety than their more-tenured colleagues but lost it over time. High psychological safety at the department level dampened the downward trajectory of newcomers' psychological safety, and, as they accrued tenure, person-level differences explained an increasing proportion of variance in individuals' beliefs about interpersonal risk taking. Drawing on these findings, we propose a framework in which situated interactions between individual and group-level climate factors shape and constrain psychological safety. We posit that the influence of these factors varies over time, partially due to dynamic asymmetries of information and differences in the consequences of interpersonal risk taking. For scholars, we hope our insights will motivate new lines of inquiry to elaborate our findings. For practitioners, our study suggests that investments to reinforce psychological safety might generate substantial benefits, especially for new employees.</p>

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Paradise Lost (and Restored?): A Study of Psychological Safety over Time

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Acknowledgements

We thank Emilio Castilla, Alexandra Killewald, and Christopher Myers for their thoughtful feedback on earlier drafts. We also thank Monica Higgins and our anonymous reviewers for their encouragement and advice throughout the review process. We are grateful for financial support from the Harvard Business School Division of Research and Harvard School of Public Health. An earlier version of this paper appeared in the *Proceedings of the 83rd Annual Meeting of the Academy of Management*.

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3 **PARADISE LOST (AND RESTORED?):**
4 **A STUDY OF PSYCHOLOGICAL SAFETY OVER TIME**
5

6 **ABSTRACT**
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8 Although prior research indicates that psychological safety can fluctuate, questions about when
9 and why remain. To gain insights into the emergence and temporal dynamics of psychological
10 safety, we explored longitudinal data representing more than 10,000 health care workers. Using
11 multilevel growth models, we discovered that clinicians with less than one year of service (i.e.,
12 newcomers) enjoyed higher psychological safety than their more-tenured colleagues but lost it
13 over time. High psychological safety at the department level dampened the downward trajectory
14 of newcomers' psychological safety, and, as they accrued tenure, person-level differences
15 explained an increasing proportion of variance in individuals' beliefs about interpersonal risk-
16 taking. Drawing on these findings, we propose a framework in which situated interactions
17 between individual and group-level climate factors shape and constrain psychological safety. We
18 posit that the influence of these factors varies over time, partially due to dynamic asymmetries of
19 information and differences in the consequences of interpersonal risk-taking. For scholars, we
20 hope our insights will motivate new lines of inquiry to elaborate our findings. For practitioners,
21 our study suggests that investments to reinforce psychological safety might generate substantial
22 benefits, especially for new employees.
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26 **Keywords:** Psychological safety, newcomers, group dynamics, longitudinal analysis, group
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30 Today's organizations rely on employees' ability to learn and collaborate to succeed. Yet,
31 barriers to learning and collaboration are common, especially those that involve interpersonal
32 risks such as speaking up, sharing ideas, or asking for help (Edmondson, 1999; see review by
33 Edmondson & Bransby, 2023). To maintain a positive image at work, people often hold back
34 ideas, concerns, and questions, thereby negatively affecting performance (e.g., Edmondson,
35 1999; Detert & Edmondson, 2011; Sherf, Parke, & Isaakyan, 2021; Frazier, Fainshmidt, Klinger,
36 Pezeshkan, & Vracheva, 2017).
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45 Psychological safety – a shared state of reduced interpersonal risk – describes a work
46 environment where people believe that timely and candid sharing is possible and expected
47 (Edmondson, 1999). Since the 1990s, numerous studies have identified psychological safety as a
48 factor associated with the effective execution of interdependent work; substantial research
49 demonstrates relationships between psychological safety and learning behaviors like speaking up
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3 and sharing knowledge, the quality of one's experience at work, and performance at the
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5 individual, group, and organizational levels (for a recent review see Edmondson & Bransby,
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7 2023). Its effects are particularly relevant in complex, knowledge-intensive work settings
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9 (Sanner & Bunderson, 2015) like health care delivery, where the timeliness and quality of
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11 interactions matter and reluctance to speak up and ask questions have profound implications for
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13 performance, quality, and safety (e.g., Edmondson, 1996; Rosenbaum, 2019; Vogus, Sutcliffe, &
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15 Weick, 2010).
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19 Yet, despite the extensive literature on psychological safety and its importance to modern
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21 work, research on the emergence and dynamics of psychological safety remains nascent (e.g.,
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23 Edmondson & Bransby, 2023; Frazier et al., 2017). We know little about how psychological
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25 safety emerges, evolves, and erodes because time has remained in the background in much of the
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27 prior research. Notable exceptions are pioneering work in this journal exploring psychological
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29 safety and performance longitudinally at the organizational level (Higgins, Dobrow, Weiner, &
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31 Liu, 2022) and a study examining how psychological safety emerges in engineering student
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33 teams (Cole et al., 2022). However, neither study specifically addressed whether and how
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35 individuals' beliefs about their ability to take interpersonal risks change over time nor
36
37 highlighted how psychological safety is built and maintained and under what conditions it is
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39 more robust or fragile (Mortensen & Haas, 2018). The issue of how psychological safety
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41 emerges and fluctuates over time is ripe for exploration (Bamberger, 2018).
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47 In this paper, we explore individuals' psychological safety as they accrue tenure in an
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49 organization using a sample of more than 10,000 health care workers from a large, multi-site
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51 health care delivery organization in the United States. Health care is an ideal context in which to
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53 explore change in psychological safety for both practical and theoretical reasons. Theoretically, it
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3 offers a context in which similarly trained professionals join multi-disciplinary departments
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5 where the ability to speak up and ask questions contributes to safe, high-quality care (e.g.,
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7 Grailey, Murray, Reader, & Brett, 2021; Rosenbaum, 2019). The practical implications are also
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9 compelling. Today, health care organizations confront high levels of turnover and must
10
11 frequently onboard new staff, engage them as team members, and seek to retain them. At the
12
13 time of this writing, one industry source put nurse turnover at over 20%, costing the average
14
15 hospital more than \$6 million annually (see report by NSI, 2023). Moreover, recent studies show
16
17 psychological safety has consequences for health care workers' mental and emotional wellness,
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19 including lowering burnout (e.g., Kerrissey et al., 2022; Rathert, Ishqaidaf, & Porter, 2022). Our
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21 empirical setting thus provides a relevant context in which to explore psychological safety over
22
23 time, to spur new theories and hypotheses about this phenomenon, and to deliver practical
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25 insights for an industry where they matter greatly.
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31 We set out in the spirit of discovery, beginning with a straightforward question: To what
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33 extent are there systematic differences in psychological safety according to individuals' tenure in
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35 an organization? Finding notable differences and a surprising trend (specifically, that new
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37 employees had higher psychological safety than their more-tenured colleagues), we performed
38
39 multilevel longitudinal analyses to examine whether and how individuals' psychological safety
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41 changed over time and to what extent a supportive context (such as a department with high
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43 psychological safety) mitigated the decline we observed. The results revealed that new
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45 employees (newcomers) were vulnerable to losing psychological safety when they may have
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47 needed it most – early in their tenure when rapid learning is essential. In our analyses, we
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49 demonstrated that newcomers indeed experienced higher psychological safety than their more-
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51 tenured colleagues, which then atrophied over time. Consistent with prior research, we also
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3 found that the level of psychological safety in the departments that newcomers joined influenced
4 their emerging beliefs about interpersonal risk-taking. The typical downward trajectory for
5 newcomers was dampened for those who joined departments with high average psychological
6 safety. Yet in contrast to prior research that has emphasized the role of contextual and group-
7 level factors in shaping and constraining psychological safety, our results implied that individual
8 differences explained an increasing proportion of variance in individuals' beliefs about risk-
9 taking as they accrued tenure in the organization. Drawing on these findings, we propose a
10 conceptual model that builds on extant research and theory to spur future research about the
11 emergence and dynamics of psychological safety.
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24 Our discoveries yield several implications for theory. First, we offer an individual
25 perspective to nascent research about the emergence and temporal dynamics of interpersonal
26 risk-taking and respond to persistent calls for longitudinal psychological safety research (e.g.,
27 Edmondson & Bransby, 2023; Edmondson & Lei, 2014; Frazier et al., 2017). Second, we
28 propose a dynamic multilevel framework emphasizing the emergent nature of psychological
29 safety, suggesting a situated interaction between individual factors (e.g., traits, perceptions,
30 attitudes, or assumptions reflecting one's competence, experience, or expectations) and group-
31 level climate factors (e.g., situational constraints, group norms, shared beliefs, and emergent
32 states). This conceptualization may help reconcile perspectives in the literature that "neither
33 disavows psychological safety as an emergent property of a group nor claims it as inherently
34 individual" (Edmondson & Bransby, 2023: 69). Third, our study signals the relevance of
35 psychological safety as an emergent property of intermediate organizational units that lie
36 between teams and the organization-at-large, such as departments, which may be especially
37 useful for settings where teams are fluid and lack stable boundaries (e.g., Kerrissey, Mayo, &
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3 Edmondson, 2021; Mayo, 2022). We also contribute to the literature on socialization by
4 suggesting factors at the individual and group levels that might help and hinder newcomers'
5 capacity to take the interpersonal risks inherent in information seeking. From a practical
6 perspective, we contribute to the broader discussion about the vital role of leaders, suggesting
7 they can bolster psychological safety by acting intentionally to prevent its loss.
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14 **AMBIGUITY ABOUT NEWCOMERS' PSYCHOLOGICAL SAFETY**

15 Although psychological safety is most often conceptualized as an emergent property of a
16 group (Edmondson & Bransby, 2023), ample research indicates the importance of an individual's
17 belief that it is safe to take interpersonal risks. Research has documented the association between
18 psychological safety and individual learning (e.g., Wilhelm, Richter, & Semrau, 2019), voice
19 (e.g., Liu, Song, Li, & Liao, 2017), creativity (e.g., Li, Li, Guo, Li, & Harris, 2018), and
20 performance (e.g., Hora, Lemoine, Xu, & Shalley, 2021; Singh, Winkel, & Selvarajan, 2013)
21 Research also demonstrates that individuals' early experiences of psychological safety have
22 lasting implications. For example, studies show that psychological safety is related to initial
23 perceptions of coworker trustworthiness (Roussin & Webber, 2012) and subsequent team
24 identification and satisfaction (Johnson & Avolio, 2019). These findings align with the literature
25 on socialization that suggests our early experiences in an organization "...strongly affect the
26 course of long-term adjustment..." (Ashforth, Sluss, & Harrison, 2008: 2).
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44 We focused our exploration on newcomers for two reasons. First, from a theoretical
45 perspective, we believed exploring newcomers' initial beliefs about risk-taking might unlock a
46 deeper understanding of psychological safety as an dynamic emergent property of a group,
47 shaped and constrained by context and by interactions and exchanges with others (Cronin,
48 Weingart, & Todorova, 2011; Kozlowski & Klein, 2000). Second, from a practical perspective,
49 newcomers benefit from psychological safety because it allows them to engage in information
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3 seeking (such as by asking a question) that reduces the uncertainty of a new job and organization
4 and leads to beneficial outcomes like learning and adjustment (Ashforth et al., 2008).
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7 **Fluctuation over Time**

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9 Despite scarce longitudinal research or theory, indications that psychological safety
10 fluctuates over time can be found in prior work. For example, Liang and colleagues (2012) found
11 that measures of individuals' psychological safety taken six weeks apart were only moderately
12 correlated. Other studies indicate that psychological safety is correlated with team and
13 organizational tenure, albeit in conflicting directions, with some indicating significant positive
14 correlations with increasing tenure (e.g., Singh, Shaffer, & Selvarajan, 2018) and others
15 indicating negative correlations (e.g., Jiang, Hu, Wang, & Jiang, 2019; Koopmann, Lanaj, Wang,
16 Zhou, & Shi, 2016). Related research links psychological safety to dynamic social phenomena
17 like status (which can change as others' respect for a target ebbs and flows; Bransby, Mayo,
18 Cronin, Park, & Yuan, 2023; Magee & Galinsky, 2008; Nembhard & Edmondson, 2006) that
19 could induce change in individuals' willingness to take interpersonal risks.
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35 Questions about when and why psychological safety fluctuates for organizational
36 newcomers are especially worth exploring because existing theory yields ambiguous accounts of
37 what might occur. For newcomers, psychological safety may be particularly tentative and subject
38 to change as individuals adjust to a new work environment and negotiate their image with peers
39 and supervisors (e.g., Van Maanen & Schein, 1979; Reichers, 1987; Ashforth et al., 2008; Cable
40 & Kay, 2012). On the one hand, upon joining an organization, newcomers may have low
41 psychological safety, reflecting the stress and uncertainty characteristic of this period (e.g., Van
42 Maanen & Schein, 1979; Feldman & Brett, 1983), preferring indirect modes of information
43 seeking that involve less interpersonal risk (Edmondson, 1999; Morrison, 2002). As they become
44 established in their new role and organization, they may then begin to view sharing and seeking
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3 information as less costly, increasing their willingness to take interpersonal risks. On the other
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5 hand, newcomers might arrive – having been selected from among others for their role – with
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7 high expectations and optimism, confident their new organization wants to hear from them; this
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9 would suggest high psychological safety. Rather than seeing the uncertainty of organizational
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11 entry as an “unwelcome threat,” they might see it as a “welcome challenge” (Ashforth et al.,
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13 2008: 39). In this case, they may feel emboldened to act, energized by the hiring decision that
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15 brought them there. Over time, however, they might find that their voice seems unwelcome,
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17 decreasing their willingness to take interpersonal risks in the future.
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21 **Psychological Safety as an Emergent State**

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23 Explaining fluctuation in psychological safety through individual preferences alone is
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25 incomplete, lacking the insights gleaned from conceptualizing psychological safety as an
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27 emergent state. An emergent state “originates in the cognition, affect, behaviors, or other
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29 characteristics of individuals, is amplified by their interactions, and manifests as a higher level,
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31 collective phenomenon” and is shaped and constrained by context (Kozlowski & Klein, 2000:
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33 55). This perspective urges us to consider influences at higher and lower levels of analysis when
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35 examining when and why psychological safety changes over time.
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40 At the individual level, socialization research shows that personal capital (i.e., what and
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42 whom you know, who you are, and who you are perceived to be, see Bauer & Erdogan, 2014)
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44 and individual characteristics like demographic attributes, personality traits, and lived experience
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46 both affect newcomer’s motivation and sensemaking capability (Ashforth et al., 2008). High
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48 self-efficacy or the prestige of one’s educational pedigree, for example, might lower the fear of
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50 being seen as inept or ignorant, such that newcomers arrive with adequate psychological safety
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52 and are better equipped to maintain it over time. Alternatively, newcomers may rely on others’
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54 expectations of their limited knowledge to buffer interpersonal risk – for example, by prefacing
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3 interactions with, “Sorry, I’m new here, but…” Likewise, interpersonal risk-taking that results in
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5 an observed (indirect) or direct positive response – for example, an inquiry met with sincere
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7 interest and curiosity from a supervisor – could increase psychological safety (Thompson &
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9 Klotz, 2022). Conversely, inquiries met with ridicule would decrease it, confirming or
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12 disconfirming one’s initial assumptions about their ability to take interpersonal risks.
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15 At higher levels, ample research demonstrates that psychological safety is shaped by
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17 context, relationships, and social phenomena (e.g., Hu, Erdogan, Jiang, Bauer, & Liu, 2018;
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19 Greenbaum, Bonner, Mawritz, Butts, & Smith, 2020; Coutifaris & Grant, 2021; see review by
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21 Edmondson & Bransby, 2023). Newcomers will likely experience a change in psychological
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23 safety as they obtain information and make sense of their own and other’s experiences in a group
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25 setting. Foulk and Long (2016), for example, found newcomers relied on observed ingratiation
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27 from coworkers to form impressions of a supervisor’s warmth but that these impressions
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29 weakened in the presence of information direct from the supervisor (e.g., expressing that they
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31 like the subordinate and that supervising them was a pleasure). Further, drawing on theories of
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33 group formation, Koopmann and her colleagues (2016) found a curvilinear relationship between
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35 team tenure (i.e., length of time a team has been together) and psychological safety in research
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37 and development teams. They proposed that short-tenured teams relied on group-based identities
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39 that facilitated positive personal relationships that strengthened psychological safety. In contrast,
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41 more-tenured teams had time to discover conflicts and differences in values, weakening
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43 psychological safety. Further, Morrison and colleagues (2011) found that group voice climate
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45 was highly predictive of individuals’ voice behavior, demonstrating the role of group-level
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47 shared beliefs (e.g., that speaking up is “safe and worth the effort” or “futile and dangerous”) on
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3 individual behavior. Examining change in psychological safety, in short, calls for consideration
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5 of factors at both individual and group levels.
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8 Taken together, the many possibilities for newcomers' psychological safety suggest
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10 several important and interesting questions about when and why it fluctuates over time. Is
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12 interpersonal risk an "unwelcome threat" to a newcomer's fragile self-image that subsides over
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14 time – or a "welcome challenge" reflecting high expectations and initial optimism? Do
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16 individual differences shape the trajectory of psychological safety over time? To what extent
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18 does the work environment determine newcomers' sense of permission for candor? In the spirit
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20 of discovery, we set out to shed initial light on these questions using multilevel longitudinal data.
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23 24 **DATA AND METHODS**

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26 We obtained longitudinal data from a large, multi-site health care delivery organization
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28 headquartered in the midwestern region of the United States, covering a period from 2017 to
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30 2021. During this period, the organization operated more than one hundred health care facilities
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32 in the U.S. and abroad, with most employees located in the U.S. Within its facilities, staff were
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34 organized in departments – representing groups for which members shared similar goals,
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36 managerial hierarchies, and physical spaces, and who were likely to interact in the course of their
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38 work. The study was approved by institutional review boards at our home institution.
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42 We leverage archival data from a biennial employee survey administered electronically to
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44 all clinicians in 2017 ($n = 21,775$ clinicians from 1,871 departments), 2019 ($n = 22,418$ clinicians
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46 from 2,235 departments), and 2021 ($n = 31,346$ clinicians from 2,933 departments). We defined
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48 clinicians as respondents who self-identified as physicians, advanced practice providers (e.g.,
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50 nurse practitioners, physician's assistants), nurses (e.g., registered nurses (RN), licensed practical
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52 nurses (LPN), nursing assistants), or allied health professionals (e.g., physical, occupational, and
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54 respiratory therapists, speech pathologists, etc.). During the study period, the organization
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3 acquired several other health care delivery organizations and expanded its geographic footprint,
4 reflected in the growing number of respondents and departments in our study period. Our data
5 included self-reported demographic information and responses to a battery of questions
6 developed by the organization for internal use. The survey addressed topics including work
7 engagement, resilience, organizational culture, patient safety, and leadership. Though
8 participation in the survey was voluntary, the response rate was high (85%, 87%, and 80% in
9 2017, 2019, and 2021, respectively).

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19 ----- INSERT TABLE 1 ABOUT HERE -----

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21 Table 1 shows the demographic composition of the successive survey waves (in 2017,
22 2019, and 2021). More than three-quarters of respondents in each wave identified as female;
23 nearly eighty percent identified as white. Nurses were the dominant professional cohort,
24 comprising more than half of the respondents in each wave.

30 Data Description

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32 ----- INSERT FIGURE 1 ABOUT HERE ----

33
34 In the spirit of discovery, we paused to examine our data, letting it guide our subsequent
35 design and methodological choices. The upper-left panel in Figure 1 depicts clinicians' average
36 psychological safety (the mean of subjects' responses to four items on a five-point scale with
37 five being the highest score) by length of service (i.e., organizational tenure) and year.¹ To our
38 surprise, it suggested that newcomers experienced higher psychological safety on average than
39 their more-tenured colleagues. One-way analysis of variance indicated significant differences in
40 mean psychological safety across tenure brackets in all waves ($F = 24.7, p < .001$); further, a
41 pairwise comparison of group means showed that psychological safety among those who
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55 ¹ For full descriptions of our measures, see the pp. 12-13.
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3 reported less than six months of service was significantly greater than that of those who reported
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5 tenures greater than six months ($p < .001$).
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8 Figure 1 visually suggests the decline in clinicians' psychological safety within the first
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10 five years of service was followed by higher levels across the remaining tenure brackets. These
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12 trends appeared to persist across demographic features, such as role, sex, and race, to varying
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14 degrees (Figure 1, panels b-d; see Table A1 in the online Appendix for bivariate descriptive
15
16 statistics)². In line with much psychological safety research, the means of clinicians'
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18 psychological safety in these data were relatively high (> 4 on a 5-point scale). As has been
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20 noted elsewhere, this restricted range inhibits the ability to detect significant effects, making
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22 significant findings particularly notable (Higgins et al., 2022). Considering these curious
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24 unadjusted cross-sectional trends, we sought to construct a panel dataset that would enable robust
25
26 longitudinal analyses of clinicians' psychological safety.
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30 31 **Sample**

32 We combined data from 2017 (time 1), 2019 (time 2), and 2021 (time 3) to produce
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34 person-period panel data consisting of 45,421 clinicians from 4,465 departments. We wished to
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36 construct a sample comprised of departments where shared group-based work occurred. We thus
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38 excluded departments comprised a single subject or dyad (1,636 clinicians were excluded at this
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40 stage) and departments that consisted of a singular role (e.g., physicians) because these
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42 departments tended to exist for wholly administrative reasons (i.e., cost centers, such as for
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44 resident physicians) and were not necessarily associated with shared work (10,617 clinicians
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46 were excluded at this stage). Next, we narrowed our focus to subjects who responded to the
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48 survey for the first time in 2017 to establish a clear target population whom we could follow over
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55 ² Appendices are available online at: https://osf.io/y8kbd/?view_only=b31ec1c29273457788bd1dddf54714ca.
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3 time; 18,052 clinicians were excluded at this stage. Finally, we excluded subjects who switched
4 departments during the study period.³ As a result, 4,690 clinicians were excluded. Our final
5 sample consisted of 10,426 clinicians from 610 departments: 5,262 (50%) provided data on one
6 occasion; 2,197 (21%) provided data on two occasions; and 2,967 (29%) provided data on all
7 three occasions. Table A2 shows the demographic composition of the final sample (see online
8 Appendix).

17 **Measures**

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19 *Clinicians' psychological safety.* We assessed clinicians' perceptions of psychological
20 safety with a four-item scale comprised of statements developed by the organization from which
21 we collected data. The items were consistent with Edmondson's (1999) conceptualization of
22 psychological safety as a shared belief that the workplace is safe for interpersonal risk-taking,
23 which the organization modified to address instances of interpersonal risk that are relevant in
24 health care (e.g., in health care, psychological safety to speak up about patient safety is seen as
25 vital to reducing medical error; see Vogus et al., 2010). Clinicians indicated their degree of
26 agreement with the following items on a five-point Likert scale (1 = strongly disagree to 5 =
27 strongly agree): "I can report patient safety mistakes without fear of punishment"; "Caregivers
28 will freely speak up if they see something that may negatively affect patient care"; "Caregivers
29 feel free to question the decisions or actions of those with more authority"; and "I feel free to
30 raise workplace safety concerns." We calculated a composite score (mean) for each clinician ($\alpha \geq$
31 .80 in all waves; see online Appendix Table A3). To further assess the appropriateness of our
32 composite score, we a conducted confirmatory factor analysis. The results supported our 4-item
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53 ³ Our multilevel model assumed a strict hierarchy where clinicians were nested in departments. A cross-classified
54 model would allow for "switchers" (i.e., those that transfer between departments), but we were unable to fit such a
55 model to our data.
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3 scale in 2017 (RMSEA = .05; CFI = .99; TLI = .99), 2019 (RMSEA = .04; CFI = .99 TLI = .99),
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5 and 2021 (RMSEA = .04; CFI = .99 TLI = .99).
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8 ***Tenure.*** The survey asked clinicians to report their tenure in the organization, described
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10 as “length of service,” on an ordinal scale with uneven increments. Response options included
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12 less than six months, six to twelve months, one to two years, and three to five years, followed by
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14 consecutive five-year increments up to twenty-five years or greater. Throughout our study,
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16 “newcomers” are participants who reported less than one year of service in 2017 (a conservative
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18 criterion following Rollag, 2007, who suggested new employees could be defined as the thirty
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20 percent of individuals in an organization with the lowest tenure). The construction of this scale
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22 meant respondents frequently reported the same length of service in multiple waves. For
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24 example, an individual with six years of service in 2017 would report “6 to 11 years of service”
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26 in all three waves. As such, we could not use it directly to mark the passage of time. Therefore,
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28 we used an indicator variable to signify the passage of time.
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34 ***Time.*** Lacking a continuous or unambiguous ordinal measure of tenure, we elected to
35
36 mark the passage of time by using indicator variables for each wave (i.e., 0, 1, and 2 in 2017,
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38 2019, and 2021, respectively) conditioned on subjects’ length of service at time 1 to account for
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40 differences in psychological safety’s rate of change over the course of a career (as suggested in
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42 Figure 1 and online Appendix Table A1). As such, our results depict the trajectory of clinicians’
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44 psychological safety over time, conditional on their initial tenure in the organization. We discuss
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46 the merits and limitations of this approach in our discussion.
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50 ***Department psychological safety climate.*** In addition to changes to individuals’
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52 psychological safety over time, we were interested in the relationship between individuals’
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54 beliefs and the aggregate level of psychological safety in their work unit, consistent with past
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3 research and theory focusing on the phenomenon as an emergent property of a group
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5 (Edmondson, 1999; see review by Edmondson & Bransby, 2023). We thus aggregated clinicians'
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7 psychological safety to the department level (e.g., cardiology clinic in a specific facility). To
8
9 determine if it was appropriate to aggregate clinicians to departments, we examined interrater
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11 agreement ($r_{wg(j)}$), interrater reliability (ICC1), and the reliability of group means (ICC2) in each
12
13 time period (Bliese, 2000).⁴ The results supported aggregation, with all indices falling within the
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15 recommended ranges (LeBreton & Senter, 2008; Woehr, Loignon, Schmidt, Loughry, & Ohland,
16
17 2015). ICC(1) was .08, .08, and .10 for times 1 to 3, respectively, indicating that sufficient
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19 variance in clinicians' psychological safety could be attributed to the department level. The
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21 reliability of group means, ICC(2), was .68, .66, and .67 for times 1 to 3, respectively, near the
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23 mean for group-level constructs reported in the literature (Woehr et al., 2015). The mean r_{wg} was
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25 .86, .84, and .82 and the median r_{wg} was .90, .89, and .87 for times 1 to 3, respectively, indicating
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27 strong agreement (LeBreton & Senter, 2008); 87% or more were above .70 in each time period.
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29 We thus calculated a composite score (group mean) for each department averaged across years in
30
31 our sample (i.e., a department's average level of psychological safety during the study period).
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33 We excluded newcomers from this procedure on the grounds that their individual beliefs may not
34
35 yet reflect those of the department (Carter, Carter, & DeChurch, 2018) and to avoid potential
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37 collinearity in subsequent estimations of newcomers' psychological safety. This measure was
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39 grand mean centered.
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47 ***Control variables.*** We controlled for several factors that prior research along with
48
49 exploration of our data suggested might influence clinicians' psychological safety. At the
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54 ⁴ Aggregation statistics are calculated using data from respondents who provided complete data in 2017 ($n = 14,666$
55 in 619 departments), 2019 ($n = 15,536$ in 698 departments), and 2021 ($n = 21,241$ in 1,108 departments).
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3 individual level, we controlled for the effect of professional status hierarchies (which place
4 physicians above other health care workers; e.g., Nembhard & Edmondson, 2006) using a crude
5 dichotomous indicator that equaled 1 if the respondent was a physician and 0 otherwise, as well
6 as demographic characteristics in line with recent trends in psychological safety research (see
7 review by Edmondson & Bransby, 2023) including sex (1 if the respondent was female), race (1
8 if the respondent was white), and age (1 if the respondent was age 18-29, 2 if age 30-49, 3 if age
9 50-69, and 4 if age > 70, reflecting the survey's ordinal response for age). We treated role, sex,
10 race, and age as continuous, time-invariant controls in our models.⁵ Reference categories were
11 selected such that the largest group was the referent. At the department level, we controlled for
12 compositional attributes like department size (i.e., number of members) and role diversity (i.e.,
13 number of distinct roles) averaged across years in our sample.

24 Analytical Approach

25 We used linear growth models (i.e., multilevel models of change, Singer & Willett, 2003)
26 to build on our insights from Figure 1. This approach enabled us to incorporate the structure of
27 our data (i.e., survey responses nested within persons and persons nested within departments)
28 and account for how various individual and departmental attributes affected psychological safety
29 over time. More specifically, we constructed a three-level growth model, where the lowest level
30 (“level 1”) is time (person-period), providing insights about what happens *within-subjects* over
31 time, the middle level (“level 2”) is the person, providing insights about what happens *between-*
32 *subjects within-units* over time, and the upper level (“level 3”) is the department, providing
33 insights about what occurs *between-units* over time.

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55 ⁵ 93% of subjects did not report a change in categorical age during the study period.
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3 We estimated four linear mixed-effects models to examine the effect of time on
4
5 clinicians' psychological safety. First, we established a baseline by estimating two unconditional
6
7 models (following Singer & Willett, 2003). The unconditional means model (model 1) allowed
8
9 us to partition and quantify variance across people and departments without regard to time; the
10
11 unconditional growth model (model 2) does so across time, people, and departments. In model 3,
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13 we introduced controls at the individual and department levels. In model 4, we added the main
14
15 effect of the department's psychological safety climate and an interaction between psychological
16
17 safety climate and time. Because we had access to only three waves of data, we were constrained
18
19 to estimating linear models of change (Singer & Willett, 2003).⁶ In all cases, we excluded
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21 individual slope random effects, following the simplifying assumption that individuals are
22
23 unlikely to have strong change trajectories driven by factors independent of the group
24
25 environment (Lang, Bliese, & De Voogt, 2018). We made this choice for parsimony and to
26
27 improve the efficiency of our models; we report our results with individual slope random effects
28
29 in Table A5 as a robustness check (see online Appendix). We fit our linear growth models using
30
31 Stata's mixed-effects command, *mixed*, and used robust standard errors and an unstructured
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33 covariance matrix for flexibility.
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40 **Missingness.** Like many surveys and longitudinal data sets, our data had a mix of
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42 reporting frequencies among subjects; some provided data on all three occasions (29%), while
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44 others reported only once (50%) or twice (21%). To deal with the missingness intrinsic to our
45
46 data, we turned to linear mixed-effects models. Under this approach, missing data present no
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48 particular problems in terms of estimation (Bliese & Ployhart, 2002; Singer & Willett, 2003). We
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55 ⁶ Models 1-4 are fully specified in online Appendix B.
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3 discuss the implications of missing data and the possibility of nonrandom selection in ways
4 correlated with the outcome as a limitation in the discussion section.
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7 8 **RESULTS**

9 ----- INSERT TABLES 2 & 3 ABOUT HERE -----

10
11 Table 2 presents means, standard deviations, and correlations for all variables. Table 3
12 shows the same information but for newcomers. While clinicians' psychological safety appeared
13 to be uncorrelated with time in the full sample, it showed a significant negative correlation
14 among newcomers ($r = -.05, p < .05$). Psychological safety at the department level showed a
15 significant positive correlation with clinicians' psychological safety both overall ($r = .28, p <$
16 $.001$) and among newcomers ($r = .18, p < .001$). Several demographic controls also showed a
17 statistically significant correlation with clinicians' psychological safety.
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27 **Residual Variance in Clinicians' Psychological Safety**

28 ----- INSERT TABLE 4 ABOUT HERE -----

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31 Models 1 and 2 in Table 4 predict clinicians' psychological safety across three levels –
32 wave (time), person, and department – conditional on tenure accrued before time 1. For those
33 who reported less than one year of service before time 1 (i.e., newcomers), time had a negative
34 effect on psychological safety ($\gamma_{100} = -.08, p < .001$). For clinicians with more than one year of
35 service at time 1, the association between time and psychological safety was not statistically
36 significant ($p > .10$ in all cases). Intercept estimates (which represent means in models 1 and 2)
37 are significant and approximately follow the decreasing, then increasing trend exposed in Figure
38 1. Further, estimates in models 1 and 2 indicate that time explained a decreasing proportion of
39 within-person residual variance as employees accrued tenure in the organization (see row 15 in
40 Table 4). The pseudo- R^2_{time} statistic demonstrated that time explained the most within-person
41 residual variance among newcomers (pseudo- $R^2_{\text{time}} = .06$) and the least among clinicians who
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3 had accrued 11-15 years of service in the organization (pseudo- $R^2_{\text{time}} = .01$).⁷ Taken together,
4 these results could imply more-tenured clinicians have more stable experiences of psychological
5 safety over time.
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10 Models 1 and 2 also offered insights about the proportion of total variance in clinicians'
11 psychological safety explained at various levels. First, we calculated interclass correlation
12 coefficients (ICCs) at the department level (ρ_{dept}), which describe the proportion of total variance
13 that lies between departments.⁸ Based on estimates from model 1, we observed that differences
14 between departments explained 1-10 percent of the total variance in clinicians' initial status
15 (Table 4, row 16). Next, we calculated ICCs at the person level (ρ_{prsn}), which describes the
16 proportion of total variance that lies between people within departments.⁹ The proportion of total
17 variance in initial status explained by differences between people within departments generally
18 *increased* as clinicians accrued tenure (Table 4, row 17). Differences between newcomers within
19 departments explained 37% of the total variance compared to 51% among clinicians with twenty
20 or more years of service.
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35 **Newcomers' Psychological Safety Over Time**

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37 Delving into the overall trends exposed by Figure 1 and Table 4 we further explored
38 change in clinicians' psychological safety among newcomers ($n = 1,538$ clinicians from 371
39 departments). Table 5 presents results from growth models examining change in newcomers'
40 psychological safety. In these models, we used indicator variables for each wave (i.e., 0, 1, and 2
41 in 2017, 2019, and 2021, respectively) to mark the passage of time. Models 1 and 2 establish a
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52 ⁷ Pseudo- $R^2_{\text{time}} = [\text{level 1 residual variance (row 14)} - \text{level 1 residual variance (row 6)}] / \text{level 1 residual variance (row 6)}$.

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54 ⁸ $\rho_{\text{dept}} = \text{level 3 residual variance (row 4)} / \text{total variance (sum of rows 4-6)}$.

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56 ⁹ $\rho_{\text{prsn}} = \text{level 2 residual variance (row 5)} / \text{total variance (sum of rows 4-6)}$.

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3 baseline, partitioning variation across time, subjects, and departments. We added controls in
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5 model 3 and the main effect of the department's psychological safety climate and an interaction
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7 between the department's psychological safety climate and time in model 4.
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10 ----- INSERT TABLE 5 AND FIGURE 2 ABOUT HERE -----

11 In model 3, congruent with the trend in Figure 1 and the results in Table 4, we found
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13 newcomers' psychological safety decreased over time.¹⁰ The department's psychological safety
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15 climate had a positive effect on newcomers' psychological safety. The negative effect of time
16
17 and positive effect of department climate were statistically significant with a *p*-value of less than
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19 .001; further, based on sample and model characteristics, the observed power was greater than
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21 99% (Bliese & Wang, 2020). Our estimation was robust to the inclusion of a level 2 individual
22
23 slope random effect, relaxing the assumption that change trajectories are not driven by factors
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25 external to the group climate (see online Appendix Table A5).
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30 To test the possibility that psychological safety climate moderated the association
31
32 between time and clinicians' psychological safety we added a cross-level interaction in model 4.
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34 There was a significant positive interaction between time and psychological safety climate on
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36 newcomers' psychological safety (*p* < .05). Figure 2 depicts the form of this interaction, in which
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38 high psychological safety at the department level dampens the downward trajectory of
39
40 psychological safety among newcomers. The lines decrease at dissimilar rates, suggesting that
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42 the loss of psychological safety could be reduced (or amplified) by a department's climate.
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46 DISCUSSION

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48 Despite the potential of longitudinal studies to "totally change the way theoretical
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50 constructs and the relationships between them are conceptualized" (George & Jones, 2000: 658),
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54 ¹⁰ As a robustness check, we recreated the analyses in Table 5 with indicator variables corresponding to respondents'
55 tenure accrued before time 1 (see online Appendix Table A6). The results are consistent with those in Table 5.
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3 their application in examining psychological safety remains rare. Questions regarding when and
4 why shared beliefs about interpersonal risk change over time and how to intervene productively
5 persist (Edmondson & Bransby, 2023). This study sheds initial light on these questions,
6 considering how individuals experience psychological safety upon their arrival and throughout
7 their tenure in an organization. As with all exploratory research, our results are preliminary. Yet,
8 we hope the insights gleaned from this work will motivate new lines of inquiry – particularly
9 about mechanisms explaining the emergence and temporal dynamics of psychological safety – to
10 advance our work further.
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21 We discovered, across multiple analyses, that newcomers enjoyed *higher* psychological
22 safety than their more-tenured colleagues but that it was soon lost, revealing a protracted period
23 where individuals were vulnerable to becoming less willing to take interpersonal risks. The
24 negative effect of time on newcomers' psychological safety makes sense given the inevitable
25 change to their *a priori* understanding of what a new role entails – what Van Maanen and Schein
26 (1979) called “reality shocks.” It follows that newcomers' initially high, then declining,
27 psychological safety could reflect the revision of faulty *a priori* assumptions and inaccurate
28 perceptions; if so, psychological safety could be especially fragile at a time when it is most
29 needed because even a rare negative experience could dramatically skew newcomers' belief that
30 it is safe to take interpersonal risks given their necessarily limited experience in the organization.
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45 We also discovered that a department's psychological safety climate influenced the
46 trajectory of newcomers' psychological safety. Our results revealed that high psychological
47 safety at the department level dampened the downward trajectory of newcomers' beliefs about
48 whether the work environment is safe for interpersonal risk-taking. Further, trends in ICCs
49 across levels of tenure imply that factors at the individual and department levels affect a
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3 clinician's beliefs about interpersonal risk-taking dissimilarly over the course of a career. We
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5 found that the proportion of within-person variance in clinicians' psychological safety explained
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7 by differences between people within departments generally increased as clinicians accrued
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9 tenure, whereas the proportion explained between departments varied but remained smaller than
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11 that at the person level. This intriguing pattern stands in contrast to studies that emphasize the
12
13 group-level and contextual factors affecting psychological safety (for examples, see review by
14
15 Edmondson & Bransby, 2023), suggesting that individual differences could play an increasingly
16
17 important role in shaping individuals' beliefs about interpersonal risk-taking as they accrue
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19 tenure in an organization.
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24 Together, these observations bring important implications for theory. First, they imply
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26 that individual differences interact with group-level and contextual factors to shape and constrain
27
28 the emergence and dynamics of psychological safety, a perspective that could be helpful in
29
30 resolving differences in the existing literature on psychological safety. While a majority of
31
32 studies in the last decade conceptualize and measure psychological safety at the team- or group-
33
34 level, others do so at the individual level, where psychological safety reflects individual beliefs
35
36 about interpersonal risk-taking that affect individual behaviors (e.g., Kahn, 1990; Carmeli &
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38 Gittell, 2009; see review by Edmondson & Bransby, 2023). Viewed through a multilevel lens,
39
40 we can reconcile these differences as pointing to a dynamic process in which individual beliefs
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42 about whether it is safe to take interpersonal risks are shaped and constrained by collective
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44 beliefs, which emerge from individual beliefs through social interactions in a group.
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49 Second, building on this insight, we can theorize how the relative weight of individual
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51 and group factors might change over time. Trends in the variance components of our models
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53 suggest that department level factors could be especially meaningful as individuals are socialized
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3 and establish themselves in an organization but less so as they accrue tenure and gain standing in
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5 their profession. Early in their careers, individuals might preference collective beliefs in their
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7 decisions to speak up, minimizing conflict and discomfort. Later in their careers, individual
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9 differences could weigh more heavily in appraisals of interpersonal risk – perhaps reflecting
10
11 increasing concern for learning and collaboration, even at the expense of personal comfort.
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13 Understanding how individual and group level factors might differentially affect individuals'
14
15 beliefs about how safe it is to take interpersonal risks could be especially helpful in guiding
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17 interventions designed to enhance psychological safety.
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22 Third, our results offer insight into the relevance of psychological safety as an emergent
23
24 property of intermediate organizational units that are larger than teams and smaller than
25
26 organizations. In the organization we studied, psychological safety in departments (which
27
28 contain members with similar goals, managerial hierarchies, and physical spaces and encompass
29
30 multiple clinician teams) meaningfully influenced newcomers' psychological safety. The
31
32 relatively large amount of variation explained between people within departments may reflect
33
34 differences between *teams* within departments (which we are unable to parse out in this study).
35
36 Yet it's also possible that our findings about the role of department climate in shaping
37
38 newcomers' psychological safety could mean that department-level differences matter in settings
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40 where teams are fluid and lack stable boundaries (like health care delivery; e.g., Kerrissey et al.,
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42 2021; Mayo, 2022).
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46 47 **Provisional Explanations for Observed Patterns**

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49 The patterns we observed prompted us to consider potential explanations for why
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51 newcomers might arrive with higher psychological safety and lose it over time, as well as for
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53 why psychological safety might then increase as individuals accrue tenure in an organization. We
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55 visually depict a provisional explanation of our findings in the form of a conceptual model
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3 (shown below in Figure 3) that builds on prior psychological safety research and the emergence
4 literature (e.g., Carter et al., 2018; Cronin et al., 2011; Kozlowski & Klein, 2000). We offer this
5 framework to inspire future research on the emergence and temporal dynamics of psychological
6 safety.
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12 We propose that change in psychological safety is jointly determined by contextualized
13 interactions between inputs at the individual and group levels, reflecting a pattern of emergence
14 whereby newcomers' initial beliefs about interpersonal risk – formed quickly based on limited
15 experience – are recalibrated over time as they accrue new information through experience in a
16 group (Kozlowski & Chao, 2012; Rapp, Maynard, Domingo, & Klock, 2021). At the individual
17 level, traits, perceptions, attitudes, and assumptions help answer the question: “How risky is this
18 behavior for someone like me?” They pertain to competence, experience, and expectations (of
19 oneself and others) and vary across individuals. At the group level, situational constraints, group
20 norms, shared beliefs, and emergent states help answer the question: “How are people treated
21 here?” Table 6 shows examples of individual and climate factors with known associations with
22 psychological safety. Future research can improve this list.
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38 The context where these factors interact is also essential for understanding the emergence
39 and evolution of psychological safety over time. Research shows that contextual factors like the
40 nature of the task (e.g., Eldor, Hodor, & Cappelli, 2023; Sanner & Bunderson, 2015), group
41 structure (e.g., Schulte, Cohen, & Klein, 2012), and the framing of the work (e.g., Edmondson,
42 2003a; Edmondson, Bohmer, & Pisano, 2001) shape psychological safety. In our setting, leaders'
43 prosocial framing of why interpersonal risk-taking matters – for instance, emphasizing that risk-
44 taking makes a positive difference in others' lives (Grant, 2007) – might factor into newcomers'
45 appraisals of psychological safety, motivating them to speak up on behalf of a patient rather than
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3 feeling afraid to do so. Future research should carefully consider the role of context in shaping
4 the interactions between individual and climate factors and the subsequent emergence of
5 psychological safety (Maloney, Bresman, Zellmer-Bruhn, & Beaver, 2016).
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10 ----- INSERT FIGURE 3 AND TABLE 6 ABOUT HERE -----
11

12 Inspired by our findings, our model suggests that the weight of individual, climate, and
13 contextual factors may vary over time. Before entry, newcomers may rely on individually held
14 assumptions to form beliefs about the risks of speaking up, sharing ideas, and asking questions in
15 the organization. They appraise interpersonal risk based individual factors with limited
16 appreciation of the context and little or no insight into their new group. However, soon after
17 starting their new position, they learn about their context through interactions with others and
18 personal experiences of interpersonal risk-taking, which leads them to update their perceptions
19 while gaining exposure to climate factors. In the subsequent period (at time $t+1$), the interaction
20 between individual and climate factors shapes psychological safety in ways that increasingly rely
21 on climate factors and context – consistent with Van Maanen and Schein’s (1979) observation
22 that newcomers are sensitive to clues about how to act in the work environment. From here, the
23 process repeats. Future psychological safety research will benefit from adopting a dynamic,
24 multilevel perspective (see Cronin et al., 2011; Kozlowski & Chao, 2012), establishing (or
25 disconfirming) the influence of individual, climate, and contextual factors, and uncovering when
26 each matters most.
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46 We use our model to offer potential explanations for the negative effect of time on
47 newcomers’ psychological safety and to prompt future research. One explanation could be that
48 newcomers’ initially high expectations of psychological safety are rooted in faulty assumptions
49 or inaccurate perceptions based on first impressions that are updated over time as information
50 accumulates through interactions with others. For example, newcomers might experience high
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3 psychological safety stemming from optimism for the future and incoming beliefs about the
4 organization influenced by organizational prestige or a positive experience in the hiring process.
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6 Over time, however, these initial expectations are challenged or proven inaccurate through
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8 experience, decreasing psychological safety. Such an explanation mirrors the findings of Zhu and
9
10 colleagues (2017) who showed that newcomers' perceptions of organizational prestige increase
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12 during periods of formal socialization (i.e., training and onboarding), then fall immediately as
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14 employees leave the structured environment, and finally recover as they settle into their first
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16 assignments.
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21 Another explanation might reflect initially low then increasing levels of accountability.
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23 For example, newcomers may arrive believing that others expect them to have limited
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25 knowledge, which reduces the interpersonal risk of speaking up, as they can preface interactions
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27 with the phrase "Sorry, I'm new here, but..." But if group members' expectations shift as time
28
29 goes on – perhaps more rapidly than newcomers' capacity to carry out the work – then
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31 newcomers may experience a new (lower) level of psychological safety. Over time, newcomers
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33 may feel they are expected to have adjusted to the organization, inhibiting their ability to ask
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35 questions or suggest new ideas. If newcomers are likely to assume their new colleagues want to
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37 hear from them, this implies a sense of psychological safety; then, over time, they will be
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39 expected to have assimilated in ways that make speaking up less welcome, decreasing
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41 psychological safety. This explanation could be seen as pessimistic; yet, our data imply that
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43 clinicians' psychological safety slowly recovers, bringing hope that *paradise* can be restored.
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49 In this study, we observed the smallest difference in psychological safety, on average,
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51 between newcomers and veteran employees with more than twenty years of service – a
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53 surprising discovery that suggested it could take decades to recover the psychological safety lost
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3 in one's first year in an organization. Yet, these measurements may be qualitatively different,
4
5 reflecting different understandings of the nature of psychological safety. For newcomers, high
6
7 psychological safety could be rooted in the idea that interpersonally risky behavior will be
8
9 universally accepted. But as a recent study by Eldor and colleagues (2023) reminds us, high
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11 psychological safety without accountability can be unhelpful. Psychological safety neither
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13 implies unconditional approval for any action no matter its intent, nor does it imply permission
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15 for needless risks or careless acts (Edmondson, 2003b, 2019), especially in high stakes settings
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17 like health care. Rather, psychological safety allows people to take the interpersonal risks
18
19 required to admit to, point out, and learn from mistakes to minimize future harm (Edmondson,
20
21 1999) – an understanding perhaps helping to explain veterans' high psychological safety. In
22
23 practice, interpersonal risks entail considerable discomfort due to the deeply rooted desire to
24
25 evade blame and avoid looking foolish (Edmondson, 2003b). However, restoring paradise may
26
27 require individuals to paradoxically embrace discomfort by accepting ambiguity and gaps in their
28
29 knowledge, learning to interpret inquiry as the friction necessary to learn and achieve desired
30
31 outcomes. Thus, the journey of “paradise lost and restored” could be one of shedding
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33 misconceptions, admitting fallibility, and coming to understand how to take risks in service of
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35 learning and collaboration. Paradise, that is, can be conceptualized as more energizing than
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37 comfortable.

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44 ***Asymmetry in the consequences of interpersonal risk-taking.*** Another powerful, if
45
46 subtle, explanation for the downward trajectory of newcomers' psychological safety lies in the
47
48 inherent asymmetry between positive and negative experiences related to interpersonal risks. A
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50 positive outcome – such as an inquiry met with sincere interest and curiosity by a supervisor
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52 (Thompson & Klotz, 2022) – may increase (and certainly does not harm) psychological safety;
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3 positive experiences should reinforce the belief that interpersonal risks can be taken, allowing
4 future risks. In contrast, a negative experience – direct or observed – could profoundly inhibit the
5 willingness to take future risks, thereby precluding opportunities to disconfirm the belief that the
6 environment is unsafe for interpersonal risks. This line of reasoning suggests that psychological
7 safety would be likely to decline, on average, over time for newcomers as they face a mix of
8 experiences and responses while taking, or observing others taking, interpersonal risks.
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10 Experimental methods could be used to investigate the validity of the effects of this natural
11 asymmetry on psychological safety.
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22 Information asymmetry also may play a role. Before entry, newcomers know little about
23 the interpersonal dynamics in their new team. Likewise, existing team members know little about
24 the newcomer. Lacking symmetric information, new and existing members must rely on personal
25 experience or general assumptions based on factors like occupational or organizational prestige,
26 shaping expectations about newcomers' willingness to take interpersonal risks. For example, in
27 hospitals, information asymmetries arise when appraising respect (which is associated with
28 psychological safety; Carmeli & Gittell, 2009; Edmondson, 1999) for a new physician colleague.
29 Research has shown that respect emerges in part from signals related to status and profession, in
30 addition to an individual's demonstrated competence (Bransby et al., 2023). Upon entry, the
31 newcomer's new colleagues are inclined to form some initial level of respect based on her
32 profession (e.g., physician) and status characteristics (e.g., being a graduate of an elite medical
33 school) without direct experience of her competence. Meanwhile, the newcomer lacks access to
34 information that would help her discern whether her new colleagues will respect her. Over time,
35 pertinent information is revealed to both parties, forcing them to update their expectations and
36 perhaps inducing a change in her willingness to take risks. Future research to understand the
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3 process by which these impressions are altered and consensus among team members emerges
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5 (e.g., Lang et al., 2018) in critical periods before and right after entry might be especially fruitful
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7 for theory and practice.
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10 Future research that goes beyond organizational newcomers to cover the wider range of
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12 employee movement within organizations could be especially useful for elaborating our model
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14 and the implications of asymmetry. For example, studies could focus on individuals who are new
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16 to a team or department but not to the organization (and therefore have some knowledge of the
17
18 organization and context but limited understanding of their new group) to answer questions like:
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20 To what extent do people carry their previous perceptions of psychological safety with them? Do
21
22 losses occur each time an employee joins a new team, or might prior positive experiences buffer
23
24 future losses when moving within an organization? Other studies could focus on those who
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26 frequently shift between groups; Might these individuals become adept at making assumptions
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28 and tuning their expectations? Do they retain a sense of psychological safety wherever they go –
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30 and, if so, might that yield positive consequences for organizations that rely on learning?
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35 **Practical Implications**

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37 Extensive research demonstrates that reducing interpersonal risk benefits learning,
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39 innovation, and performance (Edmondson & Bransby, 2023). But psychological safety is often
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41 not the default at work, and creating it is an important priority for leaders of small teams and vast
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43 enterprises alike (Edmondson, 2019). Enabling the observations and ideas of employees to be
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45 heard matters, especially in an era of increasing uncertainty and change.
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49 Our findings suggest that recently hired employees might be especially vulnerable to
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51 losing psychological safety. This indicates that leaders may have a vital role not only in building
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53 psychological safety but also in ensuring that it is not unduly lost for newcomers; this may
54
55 benefit from explicitly helping managers and longer-tenured staff see that eroding psychological
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3 safety among newcomers is neither an advantage nor a deserved reckoning for new hires.
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5 Targeted efforts to reify psychological safety among new hires rather than erode it and to
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7 promote rapid restoration of psychological safety among short-tenured staff could help
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9 organizations sustain learning and performance in the critical period after onboarding. Savvy
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11 leaders might engage in behavior to enhance psychological safety in new and short-tenured staff,
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13 for example, by sharing feedback with their junior colleagues (e.g., Coutifaris & Grant, 2021).
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17 Further, the finding that individuals' psychological safety is associated with the
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19 psychological safety climate in their work group, suggests that leaders' attention to existing
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21 group climates is vital to supporting performance, learning, and work experience. Leaders must
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23 be attentive to the work environment, taking steps to cultivate psychological safety climates,
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25 such as by modeling inclusive behaviors like inviting others' participation and exhibiting
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27 curiosity (Nembhard & Edmondson, 2006). In addition, leaders might consider assigning new
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29 employees to groups with positive climates to mitigate against losses of psychological safety or
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31 prioritizing the provision of coaching to units that absorb newcomers and that appear to struggle
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33 to establish psychological safety.
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37 **Limitations**

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39 While the size, structure, and origin of our data are a strength of this study, limitations
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41 remain. First, because the survey was developed by the organization to fulfill administrative
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43 needs without our input, certain aspects of our study design are constrained by the survey's
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45 structure and content. For example, we lacked a fine continuous measure of time or tenure. As
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47 such, we marked the passage of time using indicator variables for each wave, conditioned on
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49 subjects' ordinal length of service at time 1. We considered transformations that produced a
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51 synthetic continuous measure of time (e.g., by using midpoints of tenure brackets to assign initial
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53 values) but doing so involved many potentially untenable assumptions. Ultimately, our chosen
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3 treatment of time allowed us to make the fewest possible assumptions, reducing the risk of
4 injecting a possible source of bias into our study. Likewise, the period of our study was coarse,
5 dictated by the biennial cadence of survey administration. Future studies will benefit from
6 continuous, rather than ordinal, measures of time collected on a more frequent basis to increase
7 the resolution of and extend our findings.
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15 Second, our data was drawn from a practitioner-developed survey rather than a survey
16 designed for the purpose of academic research. The organization did not use a previously
17 validated scale to measure psychological safety, and the items that comprised the measure mixed
18 referents (i.e., “I...” vs. “Caregivers...”). Yet, psychometric tests indicated that the measure was
19 sound, and the questions formulated by the organization to describe psychological safety fit with
20 their context; this lends face validity to the measure, despite its imperfections, for the purpose of
21 this study. We were also unable to identify a respondent’s team (i.e., a smaller group with whom
22 they work regularly) from the survey and were thus limited to a department-level measure of
23 psychological safety. While department-level data offer the benefit of stability (c.f., Kerrissey,
24 Satterstrom, & Edmondson, 2020), their size and composition (e.g., along professional or
25 financial, rather than functional, dimensions) limited our ability to account for shared beliefs and
26 team dynamics that might buffer department-level climates. Despite this limitation, statistical
27 analyses suggested that departments were a meaningful group entity whose climate influenced
28 clinicians’ psychological safety.
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47 Third, our data are self-reported and thus vulnerable to bias. A high response rate – 80%
48 or greater in all waves – offered some assurance of a representative sample. Bias induced by
49 missing data and nonrandom selection (e.g., respondents with low psychological safety leaving
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3 the organization or ignoring the survey) is also a possibility.¹¹ A t-test showed that clinicians
4 with missing data reported lower psychological safety, on average, than those with complete data
5 ($t = 6.9, p < .001$). Yet, a similar test between newcomers with complete and missing data was
6 not significant ($t = 1.9, p = .06$). The consistent evidence of newcomers' declining psychological
7 safety (see Figure 1 and Tables 5 and A6) mitigates some concern about bias. If attrition by
8 subjects with low psychological safety was systematic, we would expect rising – not declining –
9 psychological safety, on average. This logic suggests that our estimates could be conservative
10 and effects of time on psychological safety could be greater than those we found. Robustness
11 checks indicated that the direction and magnitude of regression coefficients were consistent with
12 our findings even when including just those individuals who provided data on three occasions
13 (see online Appendix). Our results are robust to estimation using linear regression with
14 individual fixed effects (see online Appendix Table A8), mitigating some concerns about omitted
15 person-level variables and unobserved changes in our sample's composition over time.
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33 Finally, despite the theoretical and practical motivations supporting our empirical setting,
34 we studied a single organization, in a particular context, limiting the generalizability of the
35 findings. For example, the effect of time on newcomers' psychological safety might be different
36 in organizations outside of health care with less rigid hierarchical relationships among
37 employees. We also acknowledge that our findings are limited to the individuals who are new to
38 an organization and may not reflect the experience of individuals who are new to a team or
39 department but not the organization. Future research within and outside of health care would
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55 ¹¹ To proceed with our analyses, we assumed data were missing at random (Singer & Willett, 2003).
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shed additional light on these results and improve understanding of the emergence and temporal dynamics of psychological safety.

CONCLUSION

In an era of uncertainty and flux, psychological safety plays an important role in enabling learning and performance. Making it possible for employees to voice their observations and ideas can be essential to the quality of work and work experience alike. This study, along with prior research, drives home the point that psychological safety is not the default in workplaces. It must be actively cultivated and nurtured. Although the promise of a work environment where one's ideas and expertise feel welcome may not be *paradise*, it is surely a source of meaning and fulfillment at work. When it's lost, much is lost with it. Understanding how to prevent a loss of psychological safety and how to accelerate its restoration remain exciting questions for future research.

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TABLE 1 Initial Sample Demographics by Year (N = 45,421)

Variable	2017 (%)	2019 (%)	2021 (%)	Variable	2017 (%)	2019 (%)	2021 (%)	
Length of Service				Race^b				
< 6 mo.	5.3	4.7	6.5	Non-white	19.3	21.9	23.0	
6 mo.-1 yr.	8.4	7.9	6.3	White	80.7	78.1	77.0	
1-2 yrs.	18.8	19.1	19.2	Role				
3-5 yrs.	17.0	17.6	20.2	Physician (MD, DO)	13.8	15.3	12.9	
6-10 yrs.	17.8	17.6	16.7	Adv. Practice Prov.	6.4	6.4	6.4	
11-15 yrs.	11.7	12.3	11.7	Nurse (RN, LPN)	57.0	55.7	56.2	
16-20 yrs.	8.3	8.3	7.5	Allied Health Prof.	22.8	22.6	24.5	
21 - 25 yrs.	5.2	5.3	4.4	Age^c				
> 25 yrs.	7.7	7.2	7.5	18-29 yrs.	22.2	22.8	22.3	
Sex^a				30-49 yrs.	48.1	48.9	48.9	
Male	22.6	22.8	21.7	50-69 yrs.	29.2	27.6	27.8	
Female	77.4	77.2	78.3	> 70 yrs.	0.5	0.7	0.9	
					n(clinicians)	21,775	22,418	31,346
					n(departments)	1,871	2,235	2,933

Notes. Percentage of observations. The denominator *n* varies by demographic variable (where noted) as responses to these items were at the subject's discretion; ^a *n* = 45,326; ^b *n* = 45,311; ^c *n* = 45,281. The role "Advanced Practice Provider" (Adv. Practice Prov.) comprises physician's assistants and nurse practitioners. "Allied Health Professionals" (Allied Health Prof.) comprises physical, occupational, and respiratory therapists, speech pathologists, etc.

TABLE 2 Means, Standard Deviations, and Correlations Among Study Variables

Variables	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1. Clinicians' psych. safety	-									
2. Wave (time)	.00	-								
3. Tenure ^a	.02**	.11	-							
4. Age ^b	.03***	.19***	.61***	-						
5. Sex (1 = female)	-.03***	.02 ⁺	.06***	-.01	-					
6. Race (1 = white)	.02**	.03***	.12***	.07***	.01	-				
7. Role (1 = physician)	.02**	.00	.01 ⁺	.09***	-.40***	-.05***	-			
8. Dept. psych. safety climate	.28***	.06***	.04***	.03***	-.01	.04***	.04***	-		
9. Dept. size	-.04***	.05***	-.01 ⁺	-.08***	-.12***	-.03***	.15***	-.14***	-	
10. Dept. role diversity	-.01	.05***	.08***	.11***	-.23***	.03***	.38***	.01	.41***	-
Mean	4.1	.63	4.9	2.2	.80	.79	.10	4.1	52.7	2.8
SD	.74	.78	2.2	.72	.40	.40	.31	.22	36.9	1.0
Range	1 / 5	0 / 2	1 / 9	1 / 4	0 / 1	0 / 1	0 / 1	2.6 / 5	3 / 188.4	2 / 5.5

^a 1: < 6 mo., 2: 6 mo.-1 yr., 3: 1-2 yrs., 4: 3-5 yrs., 5: 6-10 yrs., 6: 11-15 yrs., 7: 16-20 yrs., 8: 21-25 yrs., and 9: > 20 yrs.

^b 1: 18-29 yrs., 2: 30-49 yrs., 3: 50-69 yrs., and 4: age > 70 yrs.

Notes. *n*(persons) = 10,426; *n*(departments) = 610. ⁺*p* < 0.10 **p* < 0.05, ***p* < 0.01, ****p* < 0.001.

TABLE 3 Means, Standard Deviations, and Correlations Among Study Variables (Newcomers Only)

Variables	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1. Clinicians' psych. safety	-									
2. Wave (time)	-.05*	-								
3. Tenure ^a	-.02	-.04 ⁺	-							
4. Age ^b	.02	.20***	-.01	-						
5. Sex (1 = female)	-.10***	.03 ⁺	-.04 ⁺	-.08***	-					
6. Race (1 = white)	.01	.08***	.06**	-.03	-.03	-				
7. Role (1 = physician)	.10***	-.03	.15***	.15***	-.31***	-.04 ⁺	-			
8. Dept. psych. safety climate	.18***	.06**	-.01	-.03	.00	.01	.10***	-		
9. Dept. size	.02	.02	.03	-.11***	-.06**	.05**	.13***	-.09***	-	
10. Dept. role diversity	.05*	.05*	.03	.18***	-.20***	.02	.39***	.04 ⁺	.32***	-
Mean	4.1	.46	1.6	1.6	.79	.73	.10	4.1	53.0	2.7
SD	.69	.71	.49	.66	.41	.44	.30	.21	30.9	1.0
Range	1 / 5	0 / 2	1 / 2	1 / 3	0 / 1	0 / 1	0 / 1	2.5 / 5	3 / 188.4	2 / 5.4

^a 1: < 6 mo., 2: 6 mo.-1 yr., 3: 1-2 yrs., 4: 3-5 yrs., 5: 6-10 yrs., 6: 11-15 yrs., 7: 16-20 yrs., 8: 21-25 yrs., and 9: > 20 yrs.

^b 1: 18-29 yrs., 2: 30-49 yrs., 3: 50-69 yrs., and 4: age > 70 yrs.

Notes. *n*(persons) = 1,538; *n*(departments) = 371. ⁺*p* < 0.10 **p* < 0.05, ***p* < 0.01, ****p* < 0.001.

TABLE 4 Multilevel Linear Growth Models Predicting Clinicians' Psychological Safety

Parameter	Tenure Accrued Before Time 1													
	< 1 yr.		1-2 yrs.		3-5 yrs.		6-10 yrs.		11-15 yrs.		16-20 yrs.		>20 yrs.	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
1 M1: Unconditional Means														
2 Intercept (γ_{000})	4.10	.019	4.05	.020	4.06	.021	4.07	.020	4.10	.021	4.12	.030	4.14	.020
3 Residual Variance														
4 Level 3 intercept (u_{00k})	.025	.008	.052	.011	.054	.011	.037	.010	.019	.009	.058	.017	.024	.008
5 Level 2 intercept (r_{0jk})	.176	.019	.182	.018	.221	.021	.270	.019	.265	.024	.284	.035	.279	.024
6 Level 1 residual (e_{ijk})	.269	.020	.281	.019	.329	.020	.264	.015	.273	.018	.260	.024	.246	.016
7 M2: Unconditional Growth														
8 Intercept (γ_{000})	4.13	.019	4.05	.020	4.07	.022	4.07	.015	4.09	.024	4.13	.030	4.14	.022
9 Time (γ_{100})	-.08 [†]	.019	-.01	.018	-.03	.016	-.00	.02	.014	.017	-.02	.019	.00	.016
10 Residual Variance														
11 Level 3 slope (u_{10k})	.011	.007	.012	.005	.009	.004	.008	.004	.005	.004	.010	.007	.009	.007
12 Level 3 intercept (u_{00k})	.023	.008	.052	.010	.051	.012	.038	.011	.017	.009	.056	.017	.022	.008
13 Level 2 intercept (r_{0jk})	.186	.020	.186	.017	.225	.021	.272	.019	.267	.025	.283	.034	.284	.025
14 Level 1 residual (e_{ijk})	.253	.020	.267	.019	.319	.020	.255	.013	.269	.018	.251	.023	.236	.016
15 Pseudo-R²_{time}	0.06		0.05		0.03		0.03		0.01		0.03		0.04	
16 ρ_{dept}	0.05		0.10		0.09		0.06		0.03		0.10		0.04	
17 ρ_{prsn}	0.37		0.35		0.37		0.47		0.48		0.47		0.51	
18 n(persons)	1,537		2,072		1,750		1,776		1,131		768		1,381	
19 n(departments)	371		406		426		452		378		318		401	

[†] Time was statistically significant, $p < 0.001$.

Notes. We reported cluster-robust standard errors (SE). In all cases, intercepts were statistically significant, $p < 0.001$.

TABLE 5 Multilevel Linear Growth Models Predicting Newcomers' Psychological Safety

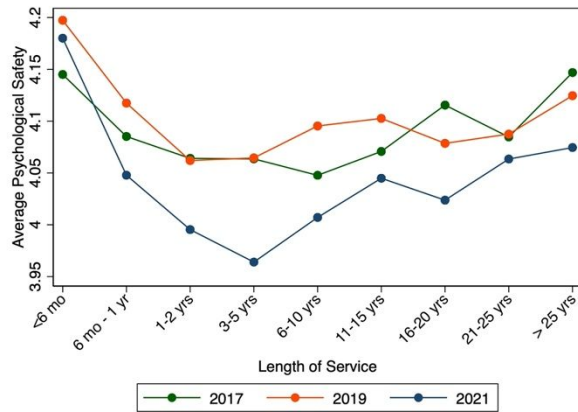
Parameter	Model 1			Model 2			Model 3			Model 4		
	Est.	SE	z	Est.	SE	z	Est.	SE	z	Est.	SE	z
Intercept	4.10***	.02	214.9	4.13***	.02	212.9	4.16***	.08	53.0	4.13***	.07	56.6
<i>Focal Predictors</i>												
Time				-.08***	.02	-4.2	-.08***	.02	-4.1	-.10***	.02	-4.9
Psych. Safety Climate										.47***	.08	5.8
Time x Psych. Safety Climate										.24**	.09	2.6
<i>Control Variables</i>												
Age							.02	.02	.67	.03	.02	1.1
Sex (1 if female)							-.12**	.04	-2.9	-.13**	.04	-3.2
Role (1 if physician)							.18**	.06	2.9	.13*	.06	2.3
Race (1 if white)							.04	.01	.94	.03	.04	0.8
Dept. Size							.00	.00	-.24	.00	.00	0.7
Dept. Role Diversity							.00	.02	.04	.00	.02	0.1
<i>Residual Variance</i>												
Level 3 slope (u_{10k})				.011	.002		.012	.007		.006	.008	
Level 3 intercept (u_{00k})	.025	.008		.023	.008		.017	.008		.004	.005	
Level 2 intercept (r_{0jk})	.176	.019		.186	.020		.185	.020		.185	.019	
Level 1 residual (e_{ijk})	.269	.020		.252	.020		.252	.020		.252	.019	
Wald χ^2		-			17.6			59.2			95.4	
AIC		4583.1			4561.0			4543.5			4498.4	
BIC		4606.0			4595.4			4612.3			4578.7	

Notes. We reported cluster-robust standard errors (SE). Newcomers are defined as those reporting < 1 year of service in 2017. $n(\text{persons}) = 1,538$, $n(\text{departments}) = 371$. Time is centered on the first response (2017) and psychological safety climate is grand-mean centered. Psychological safety climate excludes newcomers from the aggregate measure (see Measures for details). + $p < 0.10$ * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

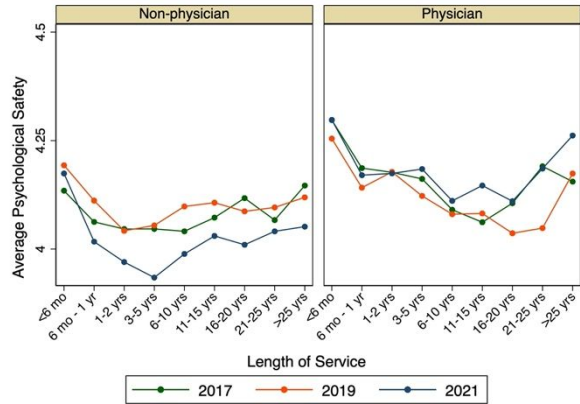
TABLE 6 Examples of Individual, Climate, and Contextual Factors Affecting Psychological Safety

Variables	Examples
Individual Factors	<ul style="list-style-type: none"> • Demographics and status characteristics (e.g., Hora et al., 2021) • Tenure (e.g., Koopmann et al., 2016) • Self-image and ego (e.g., Edmondson, 1999) • Prosocial motivation (e.g., Grant, 2007)
Climate Factors	<ul style="list-style-type: none"> • Mutual respect and trust (e.g., Carmeli & Gittell, 2009) • Voice climate / psychological safety (e.g., Edmondson, 1999) • Status hierarchies (e.g., Nembhard & Edmondson, 2006) • Power distance (e.g., Hu et al., 2018)
Contextual Factors	<ul style="list-style-type: none"> • Task environment (e.g., Sanner & Bunderson, 2015) • Group structures (e.g., Schulte et al., 2012) • Framing of the work (e.g., Edmondson, 2003a) • Organizational prestige (e.g., Zhu et al., 2017)

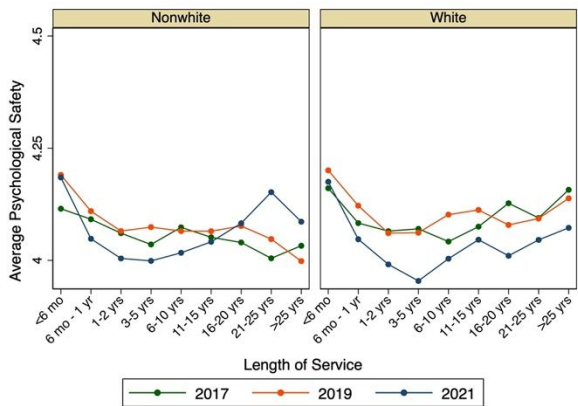
FIGURE 1 Sample Average Psychological Safety by Length of Service (2017-21)



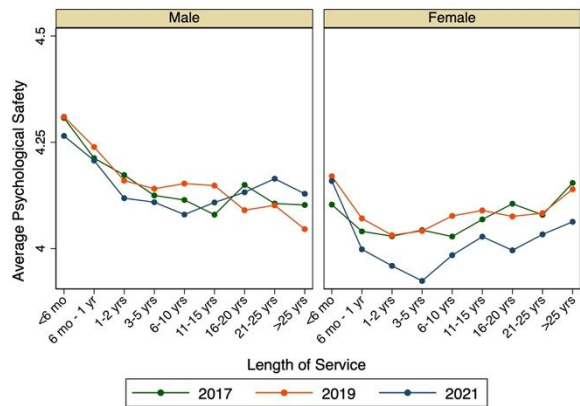
(a) Overall



(b) By Role



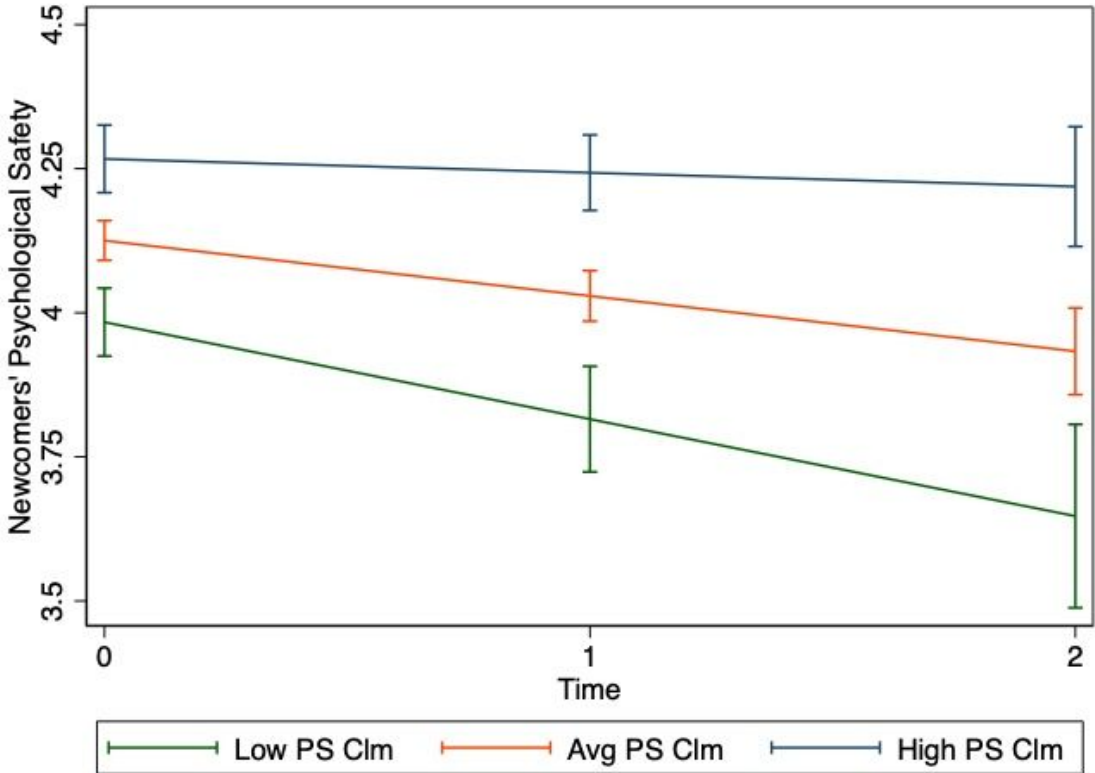
(c) By Race



(d) By Sex

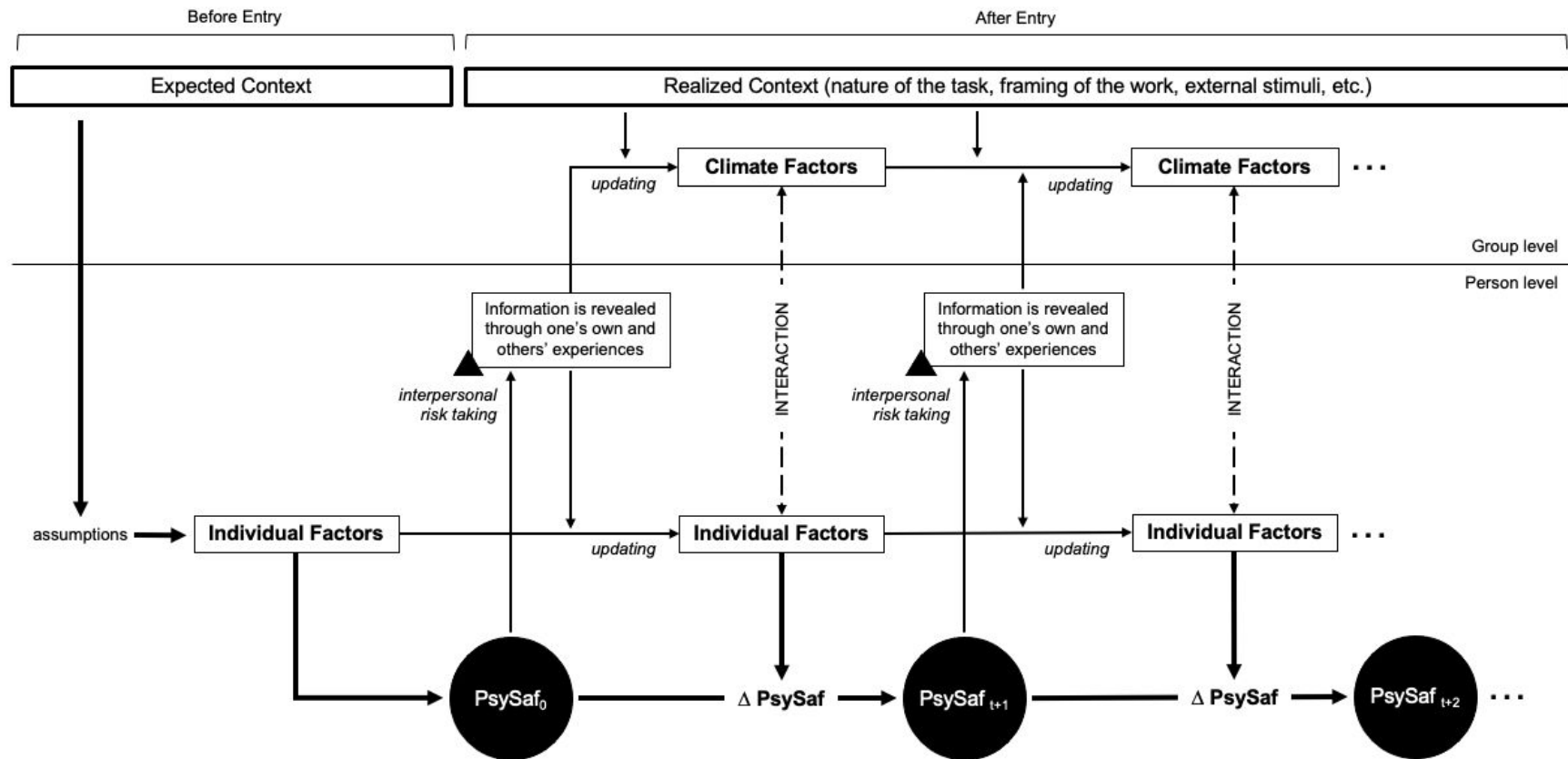
Notes. Length of service is an ordinal variable with unevenly spaced bins.

FIGURE 2 Moderating Effect of Department Psychological Safety Climate on Newcomers' Psychological Safety



Notes. "High PS Clm" refers to a value one standard deviation above the mean and "Low PS Clm" refers to a value one standard deviation below the mean. "Avg PS Clm" refers to the mean value.

FIGURE 3 Provisional Model for the Emergence and Temporal Dynamics of Psychological Safety



Notes. Dashed-lines represent cross-level interactions. Solid black triangles indicate potential asymmetric information and consequences of interpersonal risk-taking. PsySaf_0 represents individuals' psychological safety upon organizational entry. Table 6 includes examples of individual, climate, and contextual factors.

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2
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