# Team Resilience Emergence: Perspectives and Experiences of Military Personnel Selected for Elite Military Training

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1    **Abstract**

2    We conducted a longitudinal (3-month) qualitative study to examine elite military personnel's

3    (N=32) experiences and perspectives of team resilience emergence following two team-oriented

4    training courses within an 18-month high-stakes training program where personnel are required

5    to operate in newly formed tactical teams for extended periods. Our thematically informed

6    interpretations of the participants' subjective experiences of reality were constructed according to

7    five key themes: (i) adversity is an enduring, shared experience of an event; (ii) individuals

8    recognise adversity through physiological and/or behavioural states; (iii) self-regulatory skills

9    underpin individual performance, yet social resources bind them together to set the foundation

10   for team resilience; (iv) shared experiences of adversity and collective structures strengthen

11   social bonds and mental models needed for resilience emergence; and (v) behavioural processes

12   and shared states are how individual and team capacities are translated into performance under

13   adversity. These findings provide novel insights that supplement our current understanding of

14   team resilience emergence, including the varying means by which adversity may be collectively

15   experienced, synergies between specific forms of adversity and resilience processes or protective

16   factors, and the unique influence of performance context (e.g., task type).

17

18   Keywords: adversity, contagion, group dynamics, situation awareness, temporal dynamics, trust.

19       **Team Resilience Emergence: Perspectives and Experiences of Military Personnel Selected**

20                                **for Elite Military Training**

21          Teams represent critical building blocks of organisational success across many industries

22    (Salas et al., 2018) who are often exposed to experiences of major stressors or adversities that

23    pose threats to their optimal functioning. Sustaining or bouncing back relatively quickly to

24    optimal levels of collective functioning following adversity exposure, that is, displaying

25    emergent team resilience, has intuitive and practical appeal (Gucciardi et al., 2018). Scholarly

26    work on team resilience has gained traction in recent years (Chapman et al., 2020; Morgan et al.,

27    2017), resulting in enhanced understanding of key determinants and the processes by which such

28    factors foster team resilience emergence (Bowers et al., 2017; Gucciardi et al., 2018; Stoverink et

29    al., 2020). Nevertheless, no empirical research has yet been directed towards examining the

30    validity of these conceptual expositions of hypothesised determinants and processes with teams

31    undergoing stressful experiences. We addressed this gap by conducting a longitudinal, qualitative

32    investigation of team resilience emergence in a sample of personnel who were undertaking elite

33    military training.

34    **Team Resilience Emergence: A Brief Snapshot**

35          As might be expected for a new area of research (Chapman et al., 2020), scholars have

36    defined team resilience in varying ways (e.g., capacity of a team, Glowinski et al., 2016;

37    psychosocial process, Morgan et al., 2013); nevertheless, most contemporary scholars define

38    team resilience as an emergent property of a team's inputs and processes (Bowers et al., 2017;

39    Hartwig et al., 2020). We subscribe to the definition of team resilience as "an emergent outcome

40    characterised by the trajectory of a team's functioning, following adversity exposure, as one that

41    is largely unaffected or returns to normal levels after some degree of deterioration in

42    functioning" (Gucciardi et al., 2018, p. 735). Defining team resilience as an emergent outcome

43    alleviates limitations of capacity and process-based definitions, such as a reliance upon the

44    inferred positive functioning of a team in the context of adversity and ambiguity surrounding the

45    necessary and sufficient characteristics distinguishing related concepts (e.g., adaptation). This

46    definitional perspective aligns with recent calls to reconceptualise resilience as an emergent

47    outcome of a system's trajectory of functioning (e.g., Kalisch et al., 2017). In taking stock of past

48    work, Gucciardi et al. (2018) proposed a multilevel conceptual model of team resilience

49    emergence including nine propositions that capture the essence of this phenomenon (see Figure

50    1). Conceptual (Hartmann et al., 2020; Hartwig et al., 2020; Stoverink et al., 2020) and empirical

51    work (e.g., Karlsen & Berg, 2020; Talat & Riaz, 2020) has supported several elements of their

52    model of team resilience emergence. However, the usefulness of this model in its entirety as an

53    explanation of key conceptual building blocks and their interrelations for understanding the how

54    and why of team resilience emergence remains empirically untested.

**Theoretical Contributions**

56         We offer three key theoretical contributions to the literature on team resilience. First, we

57    evaluate within a military context the practical relevance of these nine core propositions and their

58    integration for characterising team resilience emergence (Gucciardi et al., 2018). This

59    contribution is important because these conceptual propositions of team resilience emergence

60    were assembled from literatures fragmented across diverse scientific disciplines (e.g.,

61    psychology, organisational behaviour) and occupational contexts (e.g., Defence, medical). In so

62    doing, we examine the scientific utility of a conceptual exposition of team resilience emergence

63    (e.g., conceptual boundaries) via an appreciation of the degree to which the conceptual building

64    blocks and their interrelations reflect organisational realities (Hambrick, 2007). This contribution

65    also has broader implications for the field of team resilience; scholars have proposed several

66    conceptual expositions of team resilience (e.g., Hartwig et al., 2020; Stoverink et al., 2020),

67    despite a limited body of empirical work (Chapman et al., 2020), so there is an urgent need for

68    examinations of their practical relevance.

69          Second, we provide a contextually and temporally rich description and interpretation of

70    team resilience emergence that sheds light on the interplay between the conceptual building

71    blocks and how they unfold over time within the context of high-stakes military training

72    characterised by substantial demands and challenges spanning several months. Context is an

73    essential feature of theory development and evaluation in the organisational sciences, yet

74    something that is often overlooked and therefore has the potential to perpetuate incomplete

75    theoretical expositions of organisational phenomena (Johns, 2006; Whetten, 2009). This

76    contribution is needed because of the reliance in past work on cross-sectional snapshots of team

77    resilience where protective factors and processes are considered largely in isolation from the

78    stressors or adversities that trigger the dynamic emergence (Chapman et al., 2020). High-stakes

79    occupational domains such as the military represent ideal contexts in which to study team

80    resilience emergence because adversity is prevalent in both training and operational contexts. We

81    focus on military personnel selected for elite military training in the current study because

82    training typically prioritises the systematic input of adversity for testing the capabilities of

83    individuals and collectives. The key question of "resilience to what" can therefore be examined

84    with precision and consistency across multiple phases of a training program.

85          Third, we focus on newly formed teams at the early stage of their life-cycle to afford

86    understanding of the critical inputs and formative processes at play during team resilience

87    emergence. Team type considerations for team resilience emergence are inevitably influenced by

88    the team's development stage (Gersick, 1988). Research on team resilience thus far has typically

89    studied mature or established teams (Furniss et al., 2011; Morgan et al., 2015) often in the

90    absence of specific knowledge of adversity events. Newly formed teams are ideal for

91    examinations of emergent phenomena as opportunities to observe emergent processes may be

92    rife within the early stages of the life-cycle, relative to established teams where these processes

93    may have already occurred (Allen & O'Neill, 2015). Thus, observation of newly formed teams

94    during their early stages of formation represents a unique vantage point upon which to explore

95    team resilience emergence and to provide an insight into the amount of time required for this

96    emergence process to occur that would be largely inaccessible within established teams.

97    **Present Study**

98          Maximising synergies between concept and method are essential for knowledge

99    advancements on team resilience emergence. We align concept and method via a longitudinal

100   approach that permits insight into the emergence process via exposure to multiple adversities. In

101   so doing, we explored the experiences and perspectives of personnel selected for elite military

102   training from a larger pool of candidates regarding team resilience emergence, specifically

103   regarding two training courses across an approximately 4-5 month period within an 18-month

104   training program.

105                                              **Methods**

106   **Philosophical Standpoint**

107          We adopted an interpretivist paradigm whereby our understanding of participants'

108   perspectives and experiences was grounded in socially and experiential personal interpretations

109   of our team (Malterud, 2016). Our ontological view is underpinned by a relativist approach in

110   which reality is multiple and indistinguishable from people's subjective experiences of the world

111    (Nicholls, 2009). To understand the subjective nature of reality and multiple truths, we adopted a

112    constructionist epistemological perspective, whereby knowledge was acquired through the co-

113    development of meaning between the participants, researchers, and their relationship in a social

114    interaction (Malterud, 2016). Inherent within this approach is the notion of research reflexivity

115    over objectivity, and an acknowledgement of the researchers' influence within the research

116    process. In other words, the findings reported here represent our interpretations of the

117    participants' subjective experiences of reality.

118    **Sample and Context**

119          We conducted this study within the context of elite military training, namely a sample of

120    Australian military personnel who were undertaking training to become qualified Special Forces

121    operators. Candidates must first complete a multi-week selection course that tests their physical

122    and mental abilities and replicates the demands of operational environments. The pass rates on

123    these courses are relatively low (e.g., in the vicinity of 20%; Gucciardi et al., 2015; Gucciardi,

124    Lines, et al., in press). Consequently, each year only a select ('elite') group of personnel will

125    progress onto Special Forces training. This training is conducted over approximately 18 months

126    during which time candidates must demonstrate the required performance standards on all

127    components to pass the program and qualify for entry into Special Forces units. Candidates must

128    demonstrate proficiency in a broad range of tasks such as basic patrolling, roping, parachuting,

129    close quarter combat, demolitions, signals, and combat first aid. The course requires individuals

130    and teams to learn complex skills within a finite period and demonstrate these skills during

131    activities that are representative of special operations missions. Throughout this training,

132    candidates are exposed to numerous acute and chronic stressors including having to: (i)

133    assimilate new information when fatigued; (ii) acquire new skills within a defined period; (iii)

134   make decisions and complete tasks under time pressure; (iv) meet performance standards at all

135   times; (v) experience constant uncertainty about whether one will be selected at the end of the

136   course; (vi) work in austere conditions (e.g., extreme weather, high altitude, variable terrain,

137   minimal food and sleep) for extended periods; (vii) perform at a high level with limited

138   opportunities for rest and recovery; (viii) be away from home/family; and (ix) complete tasks

139   involving major safety risks (e.g., firing live ammunition). Collectively, exposure to such

140   different adversities, situated within a program that requires individuals to work in teams on

141   tasks that emulate real-world job demands, makes the course a useful context to study team

142   resilience emergence.

143         We focused on military personnel who were completing elite Special Forces training

144   because their program represents an ideal context for our scholarly goals. First, teams are critical

145   to Special Forces missions; typically, personnel will operate in small teams of 4-8 members who

146   work together for extended periods and often without direct support to achieve mission

147   objectives. The training program focuses on identifying individuals who have the potential to

148   excel as part of a small team and equipping them with the requisite knowledge, skills, and

149   abilities to do so. Second, team composition within the Special Forces training program is

150   dynamic, whereby teams are newly formed towards the start of each training course, in part due

151   to membership changes throughout the overall 18-month program (e.g., candidates removed for

152   not meeting the required standards, teams strategically recomposed for assessment purposes).

153   This contextual feature meant team composition changed considerably between each data

154   collection point, yet teams were recomposed of members of the same overarching training cohort

155   and changed minimally between courses. These changes in team composition afforded an

156   opportunity to explore the development of shared realities after multiple experiences of forming

157     new teams and thus experiencing 'swift' resilience emergence within the boundaries of a specific

158     organisational context. Third, adversity is a characteristic feature of the training program for the

159     entire 18-months; candidates must complete a variety of physically and mentally demanding

160     scenarios that are indicative of those required during actual special operations missions.

161     Although adversity is present throughout the entire course, our discussions with the training staff

162     identified two critical points in the program which they believed were ideal opportunities to

163     collect data for our study. These two points were at the completion of the patrol course and close

164     quarter battle training modules; these two were specifically chosen because they involve having

165     to learn complex skills, working effectively as a team, operating in austere and dangerous

166     conditions, and are typically regarded by training staff as the most challenging courses for

167     candidates to perform well on. These 'adversity touchpoints' provided a necessary backdrop

168     upon which to generate a contextualised understanding of the temporal dynamics of team

169     resilience in an ecologically rich way.

170          We sampled participants for this study from one of the annual intakes of candidates

171     undergoing Special Forces training within the Australian Defence Force. Our research team

172     tracked these teams for 12 months prior to data collection as part of a larger project (e.g., self-

173     reported surveys, physiological assessments of stress) and so were familiar with our research

174     team and the nature of the work. Most personnel from this annual intake consented to participate

175     in this study ($N = 32$ males; $M_{age}=26.25\pm2.62$ y); these personnel made up eight and seven teams

176     at time point one and two, respectively. Participants' prior experience in Defence varied

177     ($6.87\pm2.28$ y) and included non-officers (e.g., Corporal, Warrant Officer; $n=27$) and officer ranks

178     (e.g., Captain, Major; $n=5$).

179    **Procedure**

180         We received approval from a nationally accredited human research ethics committee prior

181    to data collection. We adopted a longitudinal qualitative design to explore shared perceptions of

182    team resilience via group interviews, and the temporal dynamics of these perceptions at two

183    points, 3-months apart, within the context of an 18-month military training program. In total, we

184    conducted seven group interviews across two time points (T1: 4 focus groups, 32 participants

185    and T2: 3 focus groups, 24 participants). We collected data following two separate training

186    courses deemed to contain the necessary richness and degree of challenge to potentiate key

187    transformations within teams to permit explorations of the evolution of retrospective

188    perspectives regarding team resilience emergence (Kozlowski et al., 2013). The initial wave of

189    data collection occurred following participants' first significant exposure to a team-based training

190    course within their 18-month program, prior to which activities primarily involved the upskilling

191    of individual based competencies. The focus groups were conducted in a seminar room located

192    on a military base. The composition of these focus groups varied at each time point for logistical

193    reasons, though each group typically included personnel from 1-3 teams (4-15 members); we

194    always included personnel from the same teams for logistical (e.g., personnel from the same

195    team performed training activities on the same schedule) and substantive reasons (e.g., personnel

196    are best positioned to comment on collective dynamics in their own team). Focus group

197    discussions, which ranged from 30 to 42 min ($35 \pm 4$ min), were conducted using the same semi-

198    structured interview protocol that was informed by conceptual work on team resilience

199    emergence (Gucciardi et al., 2018; see supplementary material). The main differences in the

200    focus group discussions between time points related to the types of probes we used to encourage

201    participants to consider the temporal dynamics (e.g., how has [response] changed since last time

202    we spoke?). We guided the conversation to examine participants' perspectives of adversities

203    experienced during the training program and expectations of future adversities in the program,

204    and key individual- (e.g., personal resources) and team-level (e.g., coordination, norms)

205    determinants of team resilience emergence. Nevertheless, we welcomed participant driven

206    deviations from this schedule to maximise authenticity and leverage group dynamics within the

207    discussion. Due to the collective nature of the conversation, the interviewer adopted a facilitator

208    approach where possible to allow group conversation to dominate and opportunities for

209    agreement or conflict to occur (Bohnsack, 2004). Audio recordings of focus group discussions

210    were transcribed verbatim prior to data analysis, with a total of 46,269 words spoken.

211    **Data Analysis**

212         MC conducted the data analysis, with the support of DG who has substantive expertise on

213    team resilience and contextual knowledge of the military unit and Defence. Both analysts met

214    virtually and in person on several occasions during the data collection and analysis process to

215    discuss critically and reflexively their interpretations of the participants' discourse and determine

216    how best to illustrate the social construction of these unique perspectives. We adopted an

217    abductive approach to data analysis (Sparkes & Smith, 2014), whereby we examined

218    participants' perspectives in accordance with the guiding conceptual framework of team

219    resilience emergence (Gucciardi et al., 2018), yet remained open to new themes or ideas that may

220    disconfirm these preconceptions or reflect them in unique ways.

221         We initially coded data at each time point separately in line with Braun and colleague's

222    (2016) six stages of thematic analysis with the use of NVivo software (QSR International Pty

223    LTD, 2010): (i) reading and re-reading of interview transcripts and audio recordings; (ii) creating

224    basic, data and theory driven nodes; (iii) grouping of initial nodes through the use of thematic

225  maps; (iv) collaborative checks of the codes, themes, and entire dataset; (v) identifying the

226  essence and boundaries of each theme; and (vi) producing the report. We considered both

227  semantic (i.e., explicit meaning from expressed statements, akin to the tip of an iceberg above

228  water) and latent (i.e., implicit meaning via interpretation of ideas and meanings, akin to the base

229  of an iceberg below the water level) details for the development of themes (Braun & Clarke,

230  2019). Thus, we actively created themes to "reflect patterns of shared meaning underpinned or

231  united by a core concept" that characterise participants' experiences and perspectives on an

232  interpretive story concerned with team resilience emergence (Braun & Clarke, 2019, p. 5).

233        In line with the recurrent cross-sectional approach to longitudinal analysis of qualitative

234  research (Grossoehme & Lipstein, 2016), we compiled data for each overarching theme across

235  individual matrices to analyse the frequency and nature of responses across time. Specifically,

236  we mapped themes constructed within the cross-sectional analysis across time for the full cohort

237  of participants (see supplementary material). From these matrices we inductively constructed

238  themes from the raw coded information that reflected the nature of data at each time point. We

239  then examined patterns of consistencies or changes between the two phases including absence of

240  information to create temporal themes that characterise the dynamics of perceptions across time.

241  This approach was adopted to allow insight into the evolution of participants' perceptions

242  surrounding team resilience emergence following repeated experiences of performing within

243  newly formed teams who were exposed to adversity.

244  **Methodological Rigor**

245        Consistent with a relativist ontology, we adopted several criteria to judge the quality of

246  the research (Burke, 2016). First, the worthiness of the topic was informed by a recent literature

247  review (Chapman et al., 2020) and conceptual exposition of team resilience emergence

248    (Gucciardi et al., 2018), and priorities of the key stakeholder (Commonwealth of Australia,

249    2016), such that our work reflected a nexus between substantive and practical importance.

250    Second, rigor was maximised through the adoption of a longitudinal sampling approach, and the

251    uniqueness and relevance of the sample for the purpose of the study (Tracy, 2010). Third, we

252    addressed credibility via ongoing engagement with participants and other key personnel in the

253    unit (e.g., training staff) in the 12 months prior to the first focus groups, command approval and

254    support for the project, and team composition (e.g., mix of academic and Defence scientists).

255    Finally, reflexivity is a logical contrast to objectivity and holds important value in the

256    transparency of qualitative research (Malterud, 2016). This transparency was developed through

257    a reflexive awareness of personal assumptions, values, and commitments of the researchers

258    involved in data collection and analysis. One co-author acted as a "critical friend" (Sparkes &

259    Smith, 2014, p. 182) for the lead analyst, with the view to evaluate the data collection and

260    analysis iteratively, and provide a sounding board during the analysis (e.g., challenge

261    assumptions or interpretations, offer alternative viewpoints). Relatedly, given the conceptual

262    inconsistency between reflexive thematic analysis and saturation (Braun & Clarke, 2021), we

263    prioritised information power or richness of participant knowledge as the most suitable metric

264    for the sufficiency of our analysis.

### Results and Discussion

**Contextual evidence of emergence**

267    We based our inference of team resilience emergence across the two training courses

268    according to two key pieces of contextual information. First, participants discussed the

269    progressively challenging nature of the two training courses, and the requirement for successful

270    teams to maintain or quickly recover functioning in response to adversities embedded within the

271    courses:

272          Your training just accumulates and your tasks get more complex. You're going from like
273          a zero skill level at the start when this patrol is all together to more complex...towards the
274          later stage of the course, then things were getting a bit more hectic to that, some of those
275          variations [in performance between teams] came out. [Time point 2]
276
277    Team members seemingly demonstrated a perceived growth in capacity to face stressful

278    situations following the successful completion of courses. The competitive nature of these

279    training courses also meant that teams who insufficiently demonstrated resilient performance

280    following exposure to adversities were likely to be unable to complete training courses and likely

281    incurred the removal of group members from the course. In other words, our sample were

282    ultimately successful in utilising collective resources to navigate the individual and collective

283    challenges embedded within the course.

284          From the training leading up to it, we just dealt with stressors the whole time so that
285          we've kind of grown accustomed to it a little bit, that's helped them get through. Because,
286          like it's not really that bad. I know we can dust this off and keep going if we mess up.
287          [Time point 2]
288
289          I don't think there's been an adversity we've faced so far that's been so overwhelming
290          that we haven't been able to cope. We've been able to work together and overcome it
291          almost pretty instantaneously and then crack on. Work out the causes for it so it doesn't
292          happen again, and then carry on. [Time point 1].
293
294    Second, participants paid attention to the need for teams to demonstrate resilient trajectories of

295    functioning. Participants discussed their experiences of witnessing teams unable to progress

296    through the course when these trajectories were inadequate:

297          Yeah, in other groups, there was definitely times that they were double-checked (i.e.,
298          reprimanded or 'looked after' or taken away from the course) to a point if they weren't
299          [performing successfully]. [Time point 2]
300
301    These participant perspectives, coupled with the contextual understanding of the content and

302    assessment of course performance, demonstrates support for the assumption that collective

303    functioning within these newly formed teams resembled contextually desirable trajectories

304    following exposure to progressive adversities (for other examples, see Galatzer-Levy et al., 2018;

305    Gucciardi, Lang et al., in press). Against this contextual backdrop, we created five overarching

306    themes from our thematic analysis of the two waves of interview data to summarise participants'

307    experiences and perspectives of team resilience emergence (see Figure 2).

308    **Adversity is an enduring, shared experience of an event**

309         Adversity is central to the science of resilience because such events provide essential

310    knowledge of 'resilience to what'. Participants outlined a broad range of adversity experiences

311    that varied in magnitude (e.g., degree to which the situation might destabilise homeostasis),

312    frequency (e.g., once off or enduring), source (i.e., internal or external to the team),

313    controllability (i.e., degree to which the team can control or influence an adversity), and the

314    nature of sharedness (i.e., experienced simultaneously or concurrently by all members or

315    progressively transferred from one member to others). In essence, adversity discussed within this

316    context reflected a breadth of typically enduring, shared experiences that were underpinned by

317    the desire to perform successfully over time.

318         Previous work has characterised team resilience as involving a shared experience of

319    adversity, describing the 'collective encounter' of such experiences (Morgan et al., 2013).

320    Participants discussed several examples across both time points that captured the 'sharedness' of

321    adversity experiences in two unique ways via (i) convergent and (ii) complementary linkages.

322    Regarding convergent linkages, participants referred to the common perceptions among team

323    members, such as a shared physical demand or a change in task complexity for the team. This

324    commonality characterised experiences that were instantly mirrored across teammates regarding

325    physical exhaustion:

326          During our patrol course we had a shared adversity in that there was some pretty s**t
327          terrain that we were going through and everyone's physically taxed and that makes it a bit
328          harder when you've got to make decisions. [Time point 1]
329
330          The second description of shared experiences of adversity captured instances where one

331     or more but not all team members directly experienced adversity with or without the awareness

332     of other team members. Although some team members did not experience such adversities

333     directly, participants acknowledged a 'flow on effect' for team functioning as a shared adversity

334     because of the common bonds (e.g., collective objectives).

335          So, I think everyone would, if something happened, being that someone went down, with
336          heat or whatever happened, and that was considered an adversity by one person the whole
337          group would have the same mentality towards that. So someone getting injured, everyone
338          immediately knows, especially if you work in a small team, but this is an issue you need
339          to get on straight away. [Time point 1]
340
341     It was evident in the participants' discourse that adverse events experienced by some but not all

342     members progressively transferred to other members via a contagion effect (Barsade, 2002). By

343     and large, the shared nature of such adversities was underpinned by a type of emotional

344     contagion acting upon team members. Emotional contagion, defined as the "process by which a

345     person or group influences the emotions or behaviour of another person or group through the

346     conscious or unconscious induction of emotion states and behavioural attitudes" (Schoenewolf,

347     1990, p. 50), occurs via several key processes. The examples of shared experiences described

348     above are indicative of two such processes; the former of convergent linkages, whereby

349     individuals share the same vantage point *and* interpretations of the same stimulus, and the latter

350     of complementary linkages, whereby the reactions of one person are the stimulus for emotional

351     contagion (Elfenbein, 2014). The key distinction is the perspective from which members

352     experience and appraise an event. Convergent linkages typically result in situations where

353     members experience a similar affective state, whereas complementary linkages lead to diverse

354     emotional experiences (Elfenbein, 2014). Congruency in affective states among team members,

355     whether positive or negative in valence, are considered reflective of a shared team identity (e.g.,

356     Magee & Tiedens, 2006; van Kleef & Fischer, 2016). Shared positive emotional states in

357     collectives in/directly affect group effectiveness, yet the effects of negative affective states

358     appear contextually dependent (Barsade & Knight, 2015). For example, the coordination of a

359     team's affective state via complementary linkage may be beneficial to performance (e.g.,

360     optimising team arousal to deal with a threat or significant challenge) or detrimental (e.g.,

361     spreading of anxiety among team members) depending on the nature of the performance context

362     and team dynamics.

363          The length of exposure is another key consideration for the characterisation of adversity

364     (Cohen et al., 2019; Luhmann et al., 2020). Individuals spoke to several challenges that were

365     considered adversities because of their pervasive nature across the entire course, particularly

366     situations of continued assessment or long-term physical discomfort:

367          Many of us had pressure to perform. So constantly judged and watched on everything
368          from like your kit layout, how everything was set up, to having your mag load-out, to
369          how you were performing. That was probably the biggest stressor... I think everyone
370          could agree that was like the biggest, yeah, factor to show resilience in a team and
371          individual. That was like the biggest thing, I'd say. [Time point 2]
372
373     Chronic stressors appear most damaging due to the increased chance of exposure being present at

374     a point of vulnerability for that system, permanent changes in the state of system that may have

375     knock on effects, and increased wear and tear (i.e., allostatic load) on the system (Cohen et al.,

376     2019). The availability of collective coping strategies to deal with such adversities is crucial for

377     minimising potential risks when confronted with adversities of an enduring nature. Numerous

378     inputs and mediators have been discussed in previous work on team resilience (Bowers et al.,

379     2017; Gucciardi et al., 2018; Morgan et al., 2019), yet often absent of any consideration of the

380     varying nature of adversity experiences. Time is a critical consideration for the science of team

381     resilience because inferences regarding emergent resilience can be made only within the context

382     of a system's trajectory of functioning in response to adversity (Gucciardi et al., 2018). Although

383     elements of duration dominated the discussion of adversities here, we cannot ignore the

384     importance of features related to the frequency, timing, and sequencing of events that represent

385     heightened risk or vulnerability for advancing knowledge on team resilience emergence (e.g., see

386     Aguinis & Bakker, 2020).

387              **Temporal analysis.** Consistencies across time were evident regarding the shared nature

388     of adversity experiences and the persistence of uncertainty across the training context. Exposure

389     to shared adversities and the withholding of task-relevant information resembled core strategies

390     utilised by training staff to challenge teams over both training courses. Despite consistencies

391     across the training courses, unique challenges were also faced by participants at each time point.

392     Notably, these differences encompassed changes in the length of exposure to adversity and the

393     sources of adversity. Although chronic exposure to adversity was common among participants'

394     reflections over both time points, repeated bouts of acute challenges were discussed primarily at

395     time point two in contrast to the ongoing nature of adversity most prominent at time point one.

396     Specifically, the repeated pressure to acquire and demonstrate complex team skills was

397     commonly discussed at time point two in comparison to the continued physical challenges

398     prominent at time point one.

399              All the [simulated] close quarter battles. So, it's instantaneous decisions that need to be
400              made, and those decisions essentially do mean life and death when you're doing a
401              [mission]… So knowing the complexity [the challenges include] introducing all these
402              skills, more enemy. [Time point 2]
403
404     These individual variances are reflective of the changes in nature of tasks conducted across the

405     two time points and demonstrate an important contextual factor of this study.

406         Second, although discussed at time point one, participants reported 'pressure to perform'

407   as most prevalent following the second training course. The second time point represented a

408   point after a training course within the latter stages of the 18-month training program, where

409   personnel were subjected to numerous assessments and more complex training drills. These

410   factors likely placed added emphasis upon participants' awareness of the need to maintain

411   individual and team performance to pass the course. Collectively, these temporal nuances

412   underscore the importance of appreciating context when making inferences regarding the nature

413   of adversity experiences for team resilience emergence.

414         Variation in the perceived controllability of adversity also occurred between the two time

415   points. Participants commonly discussed adversities to be controllable following the initial

416   training course, yet when discussing adversity following the second training course responses

417   were notably absent of the controllable nature of adverse events.

418         We've got measures to control it [an adversity] so it doesn't come out of control or
419         become an issue, or what others deem as an adversity, you kind of just react so it doesn't
420         become a problem [Time point 1].
421
422   Although participants did not explicitly discuss the uncontrollable nature of adversity within the

423   second phase of data collection, the absence of data between time points has been noted as an

424   important signal of variation in perceptions within longitudinal analyses (Saldaña, 2003).

425   Coupled with perceptions of enhanced task complexity and pressure to perform, these findings

426   point to the progressive difficulty between the two courses.

427         Finally, participants' discourse changed when describing the nature of dynamic team

428   challenges, wherein initial challenges of alterations in composition (e.g., loss/removal of team

429   member) transitioned to observations of the deleterious effects of weaker team members on team

430   functioning (e.g., mistakes or inability of individuals):

431   Having members in the patrol who were just not up to standard. And I found that it was
432   actually a big burden on our team to carry them through run-throughs and scenarios and
433   pick up the slack where they were falling off. It made people more aware, they had to be
434   more aware, they had to be more focused, more switched on. They had to think not just
435   about their role but what that person's doing also. [Time point 2]
436

437 This transition in discussion points is seemingly indicative of the more homogeneous nature of

438 the participant cohort who remained on course at time point two. Diversity across deep level

439 characteristics such as personality and ability can potentially disrupt group dynamics (e.g.,

440 intragroup conflict: Harrison et al., 2002); our findings support an interpretation of the beneficial

441 nature of uniformity between team members in the current performance domain.

442 **Individuals recognise adversity through physiological and/or behavioural states**

443   Scholars have discussed the importance of recognising adversity as a key mediator

444 (Edson, 2012) or trigger (Gucciardi et al., 2018) of team resilience emergence. Participants

445 echoed this sentiment; they discussed three key indicators of adversity outlined below and the

446 importance of recognising such indicators to optimise effective functioning in the face of these

447 experiences. Collectively, these discussions indicated that individuals recognise adversity

448 through physiological and/or behavioural states, depending on the nature of the adversity or the

449 situation in which they are embedded.

450   A team's trajectory of functioning in relation to contextualised criteria represents the core

451 marker of team performance (Salas et al., 2008). Participants referenced an awareness of threats

452 to, or deviations in, collective performance because of adversity. The following participant's

453 quote reflects an awareness of change in the progress towards the collective 'end state' or

454 objective:

455   …everyone would be able to identify once we've deviated off that path of getting the
456   quickest way to reach the end state, essentially, and I think no matter what we do, we can
457   all pretty much identify once it's either slowing us down getting that end state, or it's
458   becoming for us, not the most favourable path essentially. [Time point 1]

459

460     Identifying deviation from the desired team end state within the context of adversity exposure

461     resembles the concept of situation awareness. Situation awareness reflects one's degree of

462     understanding of the dynamics of external environments produced by mental processes including

463     perception, memory, attention, and expectation, and the use of this information for current and

464     future goal directed action (Endsley, 1995). Individual situation awareness involves the

465     perception of environmental dynamics, comprehension of these dynamics, and projection of this

466     knowledge for future action (Endsley, 2015). Situation awareness is positively associated with

467     performance on a range of tasks such as military planning (Salmon et al., 2009), simulated in-

468     flight emergencies (Prince et al., 2007), and crash-avoidance in driving simulations (Gugerty,

469     1997). However, for complex systems, such as teams, unique insights regarding environmental

470     dynamics need to be distributed compatibly among members for effective performance (Stanton

471     et al., 2006, 2017). Deviations from expected team functioning represented a shared metric in

472     this regard, alongside other cues discussed below.

473         Individual recognition of adversity also related to internal stimuli. Participants discussed

474     an awareness of their own physiological state in response to adversities experienced as a team,

475     such as an enhanced level of activation when "you can feel when your heart rate's going up" or

476     "heart literally beating through your chest". Physiological states provide important knowledge

477     about environmental demands, particularly during stressful situations (Appelhans & Luecken,

478     2006; Dickerson & Kemeny, 2004), which is an important first aspect of situation awareness

479     (Endsley, 2015). People's interpretations of physiological states provide an important window

480     into efficacy beliefs, particularly in situations where physical demands are high and critical to

481     task execution (Bandura, 1997). Participants also paid attention to the recognition of adversity

482     experiences via their teammates' behaviour, primarily with reference to changes in typical

483     behaviour or persona:

484          I guess you can know from their personality, if they're normally quite banterous. And if
485          they're not, they're probably struggling a bit. I mean you hear everyone laughing,
486          everyone starts losing it and wants a part of it, if that person doesn't you can sort of be
487          like, yeah, they're either behind or struggling and they need help. [Time point 1]
488
489          Contrasting these two themes suggests that indicators of stress experiences observed in

490     others (i.e., deviations from normative behaviour) were largely incongruent with self-referenced

491     markers (i.e., physiological states). Collectively, these points highlight that threats to team

492     functioning are identified across individual and collective levels. The extent to which each type

493     of indicator is most relevant likely depends on the degree of interdependence among team

494     members; collective indicators are likely prioritised when interdependence is high, whereas

495     individual markers would likely take precedence when interdependence is low (Kozlowski &

496     Ilgen, 2006).

497          **Temporal analysis.** The temporal analysis supported consistency in the recognition of

498     changes in team member behaviours or team level functioning across both time points.

499     Participants provided less emphasis upon the value of recognising changes in internal states

500     within the second wave of data collection. The limited discussion regarding the importance of

501     individual-level indicators of adversity following the second course was coupled with an

502     emphasis of recognising adversity in team member behaviours and collective functioning:

503          You could see them not wanting to be at the front, not wanting to lead, not wanting to go
504          through the door first, not wanting to take that shot. They kind of try and sink to the back.
505          It was noticeable who was always at the back and who was always at the front during the
506          run throughs. And I think that's probably the key indicator where you can tell on the team
507          who the people were that were either stressed out, nervous, when they were performing,
508          and that was the probably the key indicator. [Time point 2]
509

510     Given the variance of specific tasks and adversities experienced across the two courses, this

511     finding highlights the centrality of recognising adversity via external states as a key feature of

512     team resilience emergence that may generalise across time and contexts.

513     **Social resources bind together individual self-regulatory capacities when confronted with**

514     **adversity to support team functioning**

515             Once an adversity and its risks are identified, teams need to leverage resources that can

516     buffer the potential effects of these adversities. Consistent with past work (Bowers et al., 2017;

517     Gucciardi et al., 2018; Hartmann et al., 2020; Hartwig et al., 2020), the knowledge, skills,

518     abilities, and other characteristics (KSAOs) individual members bring with them to the situation

519     were considered key in this regard (Ployhart et al., 2014). For our participants, emotional and

520     cognitive abilities as well as technical skills were key to task performance when confronted with

521     adversity.

522             Applying self-regulatory skills to maintain individual role performance under experiences

523     of adversity was considered key to team resilience emergence in this context. Participants drew

524     upon the importance of skills that allow them to regulate their emotional and cognitive states to

525     maintain effective and efficient functioning, such as maintaining focus in response to the

526     challenge of receiving negative group feedback:

527             The ability to refocus has got to be pretty good. Day to day you're getting very positive
528             and negative feedback. If you get some negative feedback, you've got to be able to take it
529             on board and still get on with it and perform at a high level. If you don't, you put it on
530             your team, you're just going to keep slipping down a slippery slope. [Time point 2]
531
532     Participants also discussed more broadly the importance of past experiences applying self-

533     regulatory skills successfully within the context of a variety of adversities as an important

534     individual characteristic. This discussion point is unsurprising, as mastery experiences are a key

535     source of efficacy beliefs (Bandura, 1997). Participants alluded to these benefits in terms of "past

536     experience applying revision techniques" and the importance of successful experiences applying

537     regulatory skills during challenging times on the course:

538              You might just get the revision techniques and you apply it better, now that we've used it
539              and we have experience with stressors along selection. Definitely. I think, naturally you
540              just need to be able to control yourself in situations like that. Some dudes just break and
541              we're a group of dudes that have proven it and that's why we're here. [Time point 2]
542
543     Meta-analytic research supports the importance of psychosocial skills for human performance

544     (Brown & Fletcher, 2017). For team resilience emergence, it is essential that individuals can

545     access human capital resources that are relevant for collective functioning and apply them

546     effectively when confronted with adversity (Gucciardi et al., 2018). Although certain

547     characteristics (e.g., conscientiousness; Bell et al., 2018) may be broadly beneficial to team

548     functioning, context shapes the importance of individual human capital resources on collective

549     functioning. Self-regulatory skills, which have been trialled and refined via past experiences of

550     adversity, represent an important human capital resource within the context of team resilience

551     emergence in newly formed military teams. When individuals poorly self-regulate there is an

552     increased risk of spill-over effects to collective functioning (e.g., emotional contagion).

553              Individual self-regulatory skills are essential for dealing with stressors and adversities

554     regarding one's own task performance. Yet within the context of teams, there also is a need for

555     regulation of the collective, particularly regarding the social dynamics. Participants

556     acknowledged the complementary nature of these non-technical resources because they provide

557     the 'social glue' that pulls together individual members in a united front (Kwon & Adler, 2014).

558     Non-technical resources have been defined as the cognitive, social, and personal resources that

559     support effective team functioning and complement individual technical skills (e.g., weapon

560     operation; Flin et al., 2008). Consistent with previous work on team resilience in sport teams

561     (Morgan et al., 2013), participants made specific reference to the benefit of social support outside

562    of the immediate performance environment (see Figure 1). Non-technical resources have been

563    highlighted as beneficial to teams in dealing with adverse events through the reduction of the

564    occurrence of team errors (McCulloch et al., 2009), particularly where team membership may be

565    in its early stages (Flin & Maran, 2004).

566            **Temporal analysis.** Participants placed approximately equal emphasis on the importance

567    of self-regulatory skills and non-technical resources across both time points, yet the nature of

568    discussion surrounding the importance of non-technical resources reflected a more refined

569    understanding with time. Essentially, participants emphasised the importance of displaying

570    prosocial characteristics following their first training course but with subsequent experience

571    referenced the limited nature of such characteristics when faced with adversity. For example,

572    team members would demonstrate less prosocial behaviours toward members of the team when

573    they felt their performance levels had dropped past a certain point. These findings indicate the

574    adaptive nature of teams to find ways to protect collective functioning based upon compositional

575    features of the team, such as abandoning prosocial characteristics when faced with adversity. The

576    limits of prosocial characteristics were considered in relation to shared constructs such as

577    interpersonal trust or team pride. One participant discussed how trust between team members

578    would protect the importance of prosocial characteristics on a team's approach to optimise

579    collective functioning:

580            If the team trusts them, and it's just a bad day or a bad run through, possibly even a bad
581            week, then they'll get 'don't worry about it' and you'll do anything to help them get off
582            that slippery slope – to get back up to the standard. But it's just depending on when that
583            trust runs out, that's when the team might possible leave you by the wayside. [Time point
584            2]
585
586    These findings indicate the maturing perspectives of participants by highlighting the added

587    complexity regarding how teams might actively protect collective functioning. The varying

588    importance of team members' prosocial characteristics according to individual (e.g., performance

589    ability) and collective (e.g., trust) features offers unique insight into the numerous ways by which

590    resilience may emerge within complex systems.

591    **Shared experiences of adversity and collective structures strengthen social bonds and**

592    **mental models needed for team resilience emergence**

593           When describing the importance of team-level factors that underpin team resilience

594    emergence, participants spoke to the benefit of shared past experiences and team structural

595    factors (e.g., shared leadership) to support the development of social constructs (e.g., team

596    identity) and the coordination of behaviours during experiences of adversity. Thus, this theme

597    reflects an identification of initial conditions of a system based upon prior experiences of

598    adversity and organisational norms that increase the likelihood of resilient outcomes (Hackman,

599    2012). Within the context of newly formed teams, scholarly perspectives of team development

600    have changed from one of gradual movement across stages (Tuckman, 1965) to the belief that

601    teams form certain capacities shortly after formation, which hold a strong influence over group

602    dynamics up to an approximate midpoint of team performance (Gersick, 1988). Accordingly, this

603    theme is characterised by specific social and structural factors of a team that support team

604    resilience emergence from the individual level KSAOs of group members.

605           A key discussion point regarding the initial conditions of the team related to the

606    importance of past shared experiences of adversity during the early stages of team formation and

607    development. These shared experiences seemed to foster feelings of togetherness, shared

608    confidence, and identity, such as benefits for team cohesion that resulted from challenges of

609    performing in adverse environments:

610           Yeah, so there's definitely times where you're freezing your nuts off. And you're hugging
611           each other's backs and that sort of thing. That's a key thing. And that's on selection as

612         well, breaking through that physical barrier. And actually pushing yourself into somebody
613         else's back to warm them, to warm you, that's something [Time point 1]
614
615     When considered in conjunction with the shared nature of adversity experiences, it is likely early

616     opportunities for social exchanges as a collective provided a basis from which to foster a sense of

617     "us" and "we" rather than "I" and "me" (Bastian et al., 2018). Such social identities are integral

618     for people's cognitive and behavioural engagement with stressors, particularly in group settings

619     where they can prompt collective efforts (Haslam & Van Dick, 2011) and as protective factors

620     for team resilience (Morgan et al., 2013, 2015, 2019). Participants also outlined the importance

621     of these experiences in fostering a team's shared confidence for future performance:

622         I personally think it brings everyone way tighter. You draw on those past adversities, like,
623         we've all done it. I know we've all been in s**t spots and brought each other out of it,
624         we're all still here. In my head it makes me think that we can do anything that we can put
625         our heads to. Yeah, it gives you that confidence like [name removed] said, yeah. We did
626         that, so I've got confidence that we could do something bigger. [Time point 1]
627
628     The perceived importance of emergent team confidence aligns well with experimental work that

629     has demonstrated its positive effects on collective performance (Fransen et al., 2017). The

630     structural components of teams were also discussed within participants' discussions of factors

631     that promote team resilience. A shared leadership structure, clear but flexible team roles, and the

632     presence of detailed contingency plans were commonly mentioned. Participants described the

633     importance of shared leadership abilities within the team to support problem solving in the face

634     of challenges:

635         Being a leader of the group doesn't also allow everyone else here to also slack off and just
636         wait to be told what to do. Everyone here, how we overcome stuff is everyone here shows
637         that initiative and ability. They've kind of already switched on as to what's coming in so
638         they can start doing that work for the group, sort of setting the conditions for everything;
639         you sort of solve it yourself, pretty simply before the leader actually needs to give out
640         information. So that's where we work really well together. [Time point 1]
641

642    This emphasis on shared leadership is consistent with past research on team resilience in sport

643    (Morgan et al., 2015, 2019) and research that has demonstrated the superiority of horizontal

644    forms over traditional hierarchical or vertical structures (D'Innocenzo et al., 2014; Nicolaides et

645    al., 2014). The presence of role clarity was another prominent discussion point. Within a military

646    context, standard operating procedures guide the structure and nature of such roles. The

647    criticality of these roles and the collective's awareness of them was captured clearly in a

648    participant's reflection of an adversity characterised by failure in communication equipment:

649            I think the same thing. Before we step off, everyone knows their job without comms
650            [communication channels] and actions on without comms. Everyone sort of knows there's
651            a certain amount of time or whatever. If you don't have comms, then everyone knows the
652            plan they need to execute from there, where we can all marry back up again to find out
653            what the f*** has gone wrong with the comms, or find out who's good or what's good.
654            Even with this is happening, I know what to do from here now. [Time point 1]
655
656    Standard operating procedures that include clear definitions and knowledge of key roles and

657    tasks are essential for distributing situation awareness across individual components of complex

658    systems such as a team, particularly when the collective has limited or no past experiences

659    working together (Stanton et al., 2006, 2017).

660            **Temporal analysis.** The temporal examination of this theme revealed nuances in role

661    adherence, such that the importance of this factor was pervasive across time points, yet the

662    nature of the theme was discussed differently at each wave. For example, perceptions changed

663    from one of 'knowing your role' to one where participants underscored the benefit of flexibility

664    to switch across such roles, highlighting an important adaptive process of the team. Team

665    knowledge structures have been proposed as effective in supporting adaptive processes of teams

666    (Christian et al., 2017). Shared mental models, which reflect convergent maps of the task

667    environment that enable individuals to explain and predict their surroundings (McComb, 2008),

668    were discussed by participants across time points. Participants initially spoke to a collective team

669    knowledge that reflected "everyone acting on the same idea" and having a shared understanding

670    of the "end state" during adversity. However, the discussion on these shared mental models

671    evolved to resemble an understanding of teammates' strengths and weaknesses, and the

672    prediction of teammates' behaviours throughout adversity three months later. Although team

673    members were grouped into small teams, this evolution in shared mental models is likely a

674    product of the knowledge participants developed of the entire trainee cohort over time. Within

675    the context of this study, these changes represent the development of a team's shared mental

676    model from solely an accurate understanding of task constraints towards the additional

677    knowledge of the future needs and actions of other team members (Mohammed et al., 2017).

678    This finding is consistent with work on team cognition, particularly the translation of such

679    knowledge structures into action via interactive team behaviours (i.e., interactive team cognition;

680    Cooke, 2015).

681    **Behavioural processes and shared states are how collectives turn individual and team**

682    **capacities into performance under adversity**

683           Scholars have highlighted several mediating factors or mechanisms by which emergent

684    team resilience unfolds over time (Bowers et al., 2017; Gucciardi et al., 2018). In essence, the

685    shared meaning of this theme reflects the enactment of interdependent actions and the salience of

686    shared states as the primary means by which teams utilise their individual level capacities to

687    sustain or quickly recover performance in response to heightened risk or vulnerability, that is,

688    demonstrate emergent team resilience. Participants spoke to the importance of leadership

689    behaviours in coordinating the actions of team members when faced with adversity. A key

690    behaviour in response to adversity is one where leaders make quick and effective decisions and

691    communicate this information to the team:

692          Being able to make that absolute decision then, rather than trying to wait or trying to
693          figure out what a 100% decision is. Just making a decision and sticking to that decision,
694          making that work. Rather than pausing, waiting and spending too much time trying to
695          figure out what the optimal solution is, because there probably isn't one. You just need to
696          make a decision and then make that decision work. [Time point 2]
697
698    Participants also discussed the leader's coordination of the affective state of team members,

699    particularly for regulating team members' activation levels. Perhaps most characteristic of the

700    discussions, leaders who demonstrated calm actions were identified as 'infectious' upon others:

701          Yeah, definitely someone that's calm and can coordinate a situation is obviously
702          infectious as well. Like, s**t hits the fan and everyone's freaking out then it's just
703          infectious as well. So someone that's calm and collected can coordinate, sort of step up,
704          whether they're in a leadership position or not. But yeah, calm and collected and being
705          able to coordinate a small group, it's definitely important. [Time point 1]
706
707          Several other behavioural processes between individual members were used as strategies

708    to facilitate the emergence of shared affective states across the team. Most notably, participants

709    commonly referred to the use of humour about the prospect or direct experience of adversity as a

710    means by which to foster positive affective states within the group and support sustained high

711    performance (see also, Morgan et al., 2013, 2015). Aligned with a social identity perspective

712    (Haslam & Van Dick, 2011), one participant indicated how joking between team members

713    following the experience of challenge was representative of their team and a 'signature' coping

714    strategy adopted by the group:

715          And the biggest thing that would help us as a group would be comedy amongst us. We
716          take the piss out of each other, hard. If you're an outsider and you see the things we say to
717          each other, you'd be like, "Oh, they don't like each other." That's a big part of how we
718          deal with stuff. [Time point 1]
719
720    Humour represents an effective self-regulatory strategy by which to manage one's experience

721    with stress and maximise performance (Mesmer-Magnus et al., 2012), including military team

722    resilience (Temby & Vozzo, 2017). From a cognitive standpoint, humour fosters perceptions of

723    controllability and adaptive appraisals of stress (e.g., seeing the positive or challenging side to a

724    situation; Martin et al., 2003). Humour also enables people to release pent-up energy and thereby

725    effectively manage their emotional responses to stress, which can be transmitted to their peers

726    (Robert & Wilbanks, 2012). Socially, humour serves as an important 'social lubricant', whereby

727    it fosters and sustains quality relationships with co-workers and maximises knowledge of each

728    other (Holmes, 2000), which in turn increases opportunities for social support (Moran & Hughes,

729    2006). Acting upon these opportunities for social support was also outlined by participants as a

730    key team process. Participants discussed how proactive cooperative behaviours that lightened the

731    workload or experience of adversity within team members was a crucial process (e.g., voluntary

732    rotating of task roles):

733            Constantly looking for work and filling the gaps so we talked a lot about ownership or
734            initiative so that you expect people to be looking for what needs to be done and then to go
735            and do it. We can't as team members be thinking "Oh this needs to be done, you got to do
736            that." It's happening too quickly. So expect that out of your teammates that they're
737            looking to help you out. [Time point 2]
738
739            Shared states were discussed as a means by which to complement these interdependent

740    behavioural processes. Participants referred to the beneficial nature of states such as shared trust

741    between team members when performing within the context of adversity as protective factors

742    that limit the experiences of stress across team members. Participants also spoke to the

743    importance of trust in supporting teammates, with one candidate referring to this trust in

744    allowing him to focus on his own individual coping strategies (e.g., combat breathing):

745            And that's that trust as well, so you know that if s**t does hit the fan, you don't have to
746            stress through the roof because your mates are doing their job, you can do yours. You're
747            on task, off task, helping each other out. It gets you through that stressor and then you can
748            do your combat breathing, whatever helps you. [Time point 1]
749
750            Although there is ongoing debate regarding a universally accepted definition, team trust

751    refers broadly to "generalized expectations of trustworthiness and the willingness to accept

752    vulnerability to all members" (Costa et al., 2018, p. 171). Team trust is a positive predictor of

753    team performance, even after controlling for important covariates (e.g., trust in leader, past team

754    performance), yet is contingent upon the degree of task interdependence, authority

755    differentiation, and skill differentiation (De Jong et al., 2016). Nevertheless, as a dynamic

756    concept itself, the degree and nature of the team trust-performance link may differ according to

757    temporal and contextual elements (e.g., initial level of team trust at formation, time lag; Feitosa

758    et al., 2020).

759          **Temporal analysis.** Participants predominantly discussed the importance of supportive

760    coping behaviours (e.g., sharing the workload of a teammate experiencing challenge), humorous

761    interactions, leadership behaviours, and the presence of trust between teammates at the initial

762    interview. At time point two, participants paid greater attention to the relevance of shared states

763    of cohesion and confidence between team members but remained consistent in expressing the

764    importance of effective leadership behaviours to coordinate group members. The discussion

765    surrounding the use of humour as a behavioural process is potentially reflective of the nature of

766    adversities experienced at time point one, where participants referred predominantly to the

767    chronic nature of adversity exposure experienced at time point one. The 'relief' utility of humour

768    to displace ongoing suffering (Godfrey, 2016) points to the potential benefit of humour to cope

769    with prolonged adversity exposure. This potential link between the behavioural processes

770    surrounding the use of humour and chronic adversity exposure reinforces the need to consider

771    the nature of adversity when exploring key resilience factors. This finding was mirrored by the

772    predominant discussion of planning and reflection activities following the extended challenges

773    experienced within the initial training course and less so when faced with the more frequently

774    occurring and complex challenges in the latter phases.

775        Cohesiveness and collective efficacy were discussed more prominently within the second

776    wave of interviews. For example, one individual described how "everyone has more confidence

777    now being able to work with the people [who] are left". The absence of discussion at the initial

778    stage of interviews may reflect the need for time spent as a group to foster their emergence, or at

779    least appreciate their significance for the team, rather than a change in the net worth of these

780    shared states. Collective efficacy, for example, is most influential upon team functioning after

781    several weeks because of prior teamwork behaviours (Tasa et al., 2007). As previously

782    mentioned, the importance of interactions between the members of the entire cohort between

783    training activities would have acted to foster emergence of shared states, and points to the

784    potential links between early team coping behaviours and protective emergent states. Certain

785    interactive coping strategies enacted within the initial experiences of performing in a new team

786    may have served as inputs to the development of collective states that further act as protective

787    factors within the second training course (e.g., humour fostering social cohesion: Godfrey, 2016).

788    Such a perspective is consistent with the conceptualisation of resilience factors as dynamic

789    network models, whereby one resilience factor may be 'activated' by another resilience factor

790    (Kalisch et al., 2019).

791                                            **Theoretical Implications**

792        Our study provides a contextually and temporally rich description and interpretation of

793    team resilience emergence that sheds light on the interplay between the conceptual building

794    blocks and how they unfold over time within the context of high-stakes military training

795    characterised by substantial demands and challenges spanning several months. In so doing, the

796    results of this study offer two key theoretical contributions to the literature on team resilience.

797     First, our thematic integration and interpretation of military personnel's perspectives

798     support key elements of our guiding conceptual model of team resilience emergence. In terms of

799     theoretically-informed elements, we revealed support for the centrality of adversity experiences

800     as triggers for emergence processes (Gucciardi et al., 2018; Stoverink et al., 2020); individual

801     human capital resources (Gucciardi et al., 2018), situation awareness (Gomes et al., 2014;

802     Gucciardi et al., 2018), team-level factors and states including leadership, team identity

803     (Gucciardi et al., 2018; Morgan et al., 2013), and shared mental models (Gucciardi et al., 2018;

804     Morgan et al., 2019; Stoverink et al., 2020) as key drivers of the emergence process and

805     outcomes; and behavioural, cognitive, and affective (i.e., humour, trust) coordination among

806     members in translating capacities into high-performance when confronted with stressors or

807     adversities. We uncovered links between specific characteristics of adversities and the coping

808     mechanisms adopted in such circumstances, such as the use of humour to handle chronic

809     stressors. We also illustrated how task constraints play a role in shaping the coping mechanisms

810     adopted by newly formed teams. For example, performing repeated complex activities precluded

811     the use of planning and reflection regulatory strategies. Considered collectively, these data

812     connect conceptual perspectives with the dynamic realities of newly formed military teams'

813     engagement with stressors and adversities in ways that shine a spotlight on potential conceptual

814     refinements to the phenomenon of team resilience emergence.

815     Second, our contextually and temporally rich exposition of adversity experiences over

816     time provides new insights into the nature and range of adversities common within this context.

817     These insights illustrated how shared adversities can arise from either shared experiences or the

818     'catching' of experiences from others, and the more debilitating effect of chronic stressors upon

819     team functioning. This contribution is important for the science of team resilience because

820    adversity is a necessary condition that must be present for conceptually and empirically robust

821    operationalisations of the emergence process and outcomes; in the absence of knowledge of the

822    adversity experience that has triggered the emergence process, we are unable to answer the

823    question "resilience to what". Adversities are characterised by elements relating to valence,

824    impact, predictability, challenge, emotional significance, change in world views, social status

825    changes, external control, and extraordinariness (Luhmann et al., 2020). Our findings

826    underscored the centrality of the nature of sharedness for characterising adversity experiences

827    within the context of organisational teams and the team resilience emergence process. Whether

828    an adversity is experienced simultaneously among all members or is progressively transferred

829    from one or some members to others has important implications for the emergence process and

830    outcomes (e.g., contagion). These implications include the immediacy of disturbances to team

831    functioning, and the ostensible nature of adversity to team members that would dictate the

832    tailoring of reactive coping strategies (e.g., whole team vs sub-section responses). Thus, our

833    findings underscore conceptual and practical nuances regarding the temporal elements of

834    adversity experiences that are largely absent from past work on team resilience (for a review of

835    multilevel stressor research in teams, see Razinskas & Hoegl, 2020). Extending beyond the

836    science of team resilience, our work underscores the need to broaden conceptual perspectives of

837    major life events to encompass elements related to the social nature of such experiences, which

838    are absent from existing perspectives and taxonomies (Luhmann et al., 2020).

839                          **Strengths, Limitations, and Future Directions**

840            We have described a contextually and temporally rich investigation of newly formed

841    teams undergoing high-stakes military training characterised by numerous stressors and

842    adversities. Future work may look to leverage and extend these findings, particularly regarding

843       the conceptual and methodological limitations of our work. For example, our reliance on

844       retrospective interviews could be strengthened via data-prompted discussions that leverage

845       stimuli from in situ experiences with major stressors or adversities (e.g., biofeedback). Relatedly,

846       the absence of metrics to characterise trajectories of collective functioning over time within the

847       context of adversity means we are unable to appreciate fully the degree to which teams

848       demonstrated emergent team resilience, other than a crude assessment of successful progression

849       through the course. For example, there may be important nuances in the perspectives and

850       experiences of teams who demonstrate varying degrees and/or types of emergent team resilience.

851       Finally, we acknowledge there is a need to consider the complexities of team resilience

852       emergence within multi-team systems (Shuffler & Carter, 2018) including work contexts where

853       the stakes are low and adversities are less frequent, yet team functioning remains critical to work

854       success.

## Conclusion

856       Scholarly interest in the phenomenon of team resilience emergence is on the rise (Bowers

857       et al., 2017; Hartmann et al., 2020; Hartwig et al., 2020; Stoverink et al., 2020). We

858       retrospectively examined the perceptions of team resilience emergence of newly formed military

859       teams following two training courses across a 4-5 month period within the context of an 18-

860       month long training program, and provided insight into temporal dynamics of these perceptions

861       of team resilience over the early stages of team development. We constructed the essence of

862       participants' discussions across five broad themes and considered their temporal elements across

863       the two waves (see Figure 2). Collectively, these data broadly support the conceptualisation of

864       team resilience emergence that informed this work (Gucciardi et al., 2018), and provide a

865    meaningful basis for scholars to consider when interpreting and exploring conceptual

866    perspectives of team resilience emergence within future empirical studies.

**References**

867

868     Aguinis, H., & Bakker, R. M. (2020). Time is of the essence: Improving the conceptualization

869            and measurement of time. *Human Resource Management Review*, 100763.

870            https://doi.org/10.1016/j.hrmr.2020.100763

871     Allen, N. J., & O'Neill, T. A. (2015). The trajectory of emergence of shared group-level

872            constructs. *Small Group Research*, *46*, 352–390.

873            https://doi.org/10.1177/1046496415584973

874     Appelhans, B. M., & Luecken, L. J. (2006). Heart rate variability as an index of regulated

875            emotional responding. *Review of General Psychology*, *10*, 229–240.

876            https://doi.org/10.1037/1089-2680.10.3.229

877     Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman.

878     Barsade, S. G. (2002). The ripple effect: Emotional contagion and its influence on group

879            behavior. *Administrative Science Quarterly*, *47*, 644–675.

880            https://doi.org/10.2307/3094912

881     Barsade, S. G., & Knight, A. P. (2015). Group affect. *Annual Review of Organizational

882            Psychology and Organizational Behavior*, *2*, 21–46. https://doi.org/10.1146/annurev-

883            orgpsych-032414-111316

884     Bastian, B., Jetten, J., Thai, H. A., & Steffens, N. K. (2018). Shared adversity increases team

885            creativity through fostering supportive interaction. *Frontiers in Psychology*, *9*.

886            https://doi.org/10.3389/fpsyg.2018.02309

887     Bell, S. T., Brown, S. G., Colaneri, A., & Outland, N. (2018). Team composition and the ABCs

888            of teamwork. *American Psychologist*, *73*, 349–362. https://doi.org/10.1037/amp0000305

889    Bohnsack, R. (2004). Group discussion and focus groups. In U. Flick, E. von Kardoff, & I.

890         Steinke (Eds.), *A companion to qualitative research* (pp. 214–222). Sage Publications.

891    Bowers, C., Kreutzer, C., Cannon-Bowers, J., & Lamb, J. (2017). Team resilience as a second-

892         order emergent state: A theoretical model and research directions. *Frontiers in*

893         *Psychology*, *8*, 1360. https://doi.org/10.3389/fpsyg.2017.01360

894    Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research*

895         *in Sport, Exercise and Health*, *11*, 589–597.

896         https://doi.org/10.1080/2159676X.2019.1628806

897    Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a

898         useful concept for thematic analysis and sample-size rationales. *Qualitative Research in*

899         *Sport, Exercise and Health*, *13*(2), 201–216.

900         https://doi.org/10.1080/2159676X.2019.1704846

901    Braun, V., Clarke, V., & Weate, P. (2016). Using thematic analysis in sport and exercise research.

902         In B. Smith & A. Sparkes (Eds.), *Routledge handbook of qualitative research methods in*

903         *sport and exercise* (pp. 191–205). Routledge.

904    Brown, D. J., & Fletcher, D. (2017). Effects of psychological and psychosocial interventions on

905         sport performance: A meta-analysis. *Sports Medicine*, *47*, 77–99.

906         https://doi.org/10.1007/s40279-016-0552-7

907    Burke, S. (2016). Rethinking 'validity' and 'trustworthiness' in qualitative inquiry: How might

908         we judge the quality of qualitative research in sport and exercise sciences? In B. Smith &

909         A. Sparkes (Eds.), *Routledge Handbook of Qualitative Research in Sport and Exercise*

910         (pp. 352–362). Routledge.

911   Chapman, M. T., Lines, R. L. J., Crane, M., Ducker, K. J., Ntoumanis, N., Peeling, P., Parker, S.

912          K., Quested, E., Temby, P., Thøgersen-Ntoumani, C., & Gucciardi, D. F. (2020). Team

913          resilience: A scoping review of conceptual and empirical work. *Work & Stress*, *34*, 57–81.

914          https://doi.org/10.1080/02678373.2018.1529064

915   Christian, J. S., Christian, M. S., Pearsall, M. J., & Long, E. C. (2017). Team adaptation in

916          context: An integrated conceptual model and meta-analytic review. *Organizational*

917          *Behavior and Human Decision Processes*, *140*, 62–89.

918          https://doi.org/10.1016/j.obhdp.2017.01.003

919   Cohen, S., Murphy, M. L. M., & Prather, A. A. (2019). Ten surprising facts about stressful life

920          events and disease risk. *Annual Review of Psychology*, *70*, 577–597.

921          https://doi.org/10.1146/annurev-psych-010418-102857

922   Commonwealth of Australia. (2016). *Shaping Defence Science and Technology in the Land*

923          *Domain 2016-2036.* Department of Defence.

924          https://www.dst.defence.gov.au/sites/default/files/divisions/documents/LandS%26T.pdf

925   Cooke, N. J. (2015). Team cognition as interaction. *Current Directions in Psychological Science*,

926          *24*, 415–419. https://doi.org/10.1177/0963721415602474

927   Costa, A. C., Fulmer, C. A., & Anderson, N. R. (2018). Trust in work teams: An integrative

928          review, multilevel model, and future directions. *Journal of Organizational Behavior*, *39*,

929          169–184. https://doi.org/10.1002/job.2213

930   De Jong, B. A., Dirks, K. T., & Gillespie, N. (2016). Trust and team performance: A meta-

931          analysis of main effects, moderators, and covariates. *Journal of Applied Psychology*, *101*,

932          1134–1150. https://doi.org/10.1037/apl0000110

933     Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: A theoretical

934          integration and synthesis of laboratory research. *Psychological Bulletin*, *130*, 355–391.

935          https://doi.org/10.1037/0033-2909.130.3.355

936     D'Innocenzo, L., Mathieu, J. E., & Kukenberger, M. R. (2014). A meta-analysis of different

937          forms of shared leadership–team performance relations. *Journal of Management*, *42*,

938          1964–1991. https://doi.org/10.1177/0149206314525205

939     Edson, M. C. (2012). A complex adaptive systems view of resilience in a project team. *Systems*

940          *Research and Behavioral Science*, *29*, 499–516. https://doi.org/10.1002/sres.2153

941     Elfenbein, H. A. (2014). The many faces of emotional contagion: An affective process theory of

942          affective linkage. *Organizational Psychology Review*, *4*, 326–362.

943          https://doi.org/10.1177/2041386614542889

944     Endsley, M. R. (1995). Measurement of situation awareness in dynamic systems. *Human*

945          *Factors*, *37*, 65–84. https://doi.org/10.1518/001872095779049499

946     Endsley, M. R. (2015). Situation awareness misconceptions and misunderstandings. *Journal of*

947          *Cognitive Engineering and Decision Making*, *9*, 4–32.

948          https://doi.org/10.1177/1555343415572631

949     Feitosa, J., Grossman, R., Kramer, W. S., & Salas, E. (2020). Measuring team trust: A critical and

950          meta-analytical review. *Journal of Organizational Behavior*, *41*(5), 479–501.

951          https://doi.org/10.1002/job.2436

952     Flin, R., & Maran, N. (2004). Identifying and training non-technical skills for teams in acute

953          medicine. *Quality and Safety in Healthcare*, *13*, 180–184.

954          https://doi.org/10.1136/qshc.2004.009993

955     Flin, R., O'Connor, P., & Crichton, M. (2008). *Safety at the sharp end: A guide to non-technical*

956          *skills*. Ashgate.

957     Fransen, K., Mertens, N., Feltz, D., & Boen, F. (2017). "Yes, we can!" review on team

958          confidence in sports. *Current Opinion in Psychology*, *16*, 98–103.

959          https://doi.org/10.1016/j.copsyc.2017.04.024

960     Furniss, D., Back, J., Blandford, A., Hildebrandt, M., & Broberg, H. (2011). A resilience markers

961          framework for small teams. *Reliability Engineering and System Safety*, *96*, 2–10.

962          https://doi.org/10.1016/j.ress.2010.06.025

963     Galatzer-Levy, I. R., Huang, S. H., & Bonanno, G. A. (2018). Trajectories of resilience and

964          dysfunction following potential trauma: A review and statistical evaluation. *Clinical*

965          *Psychology Review*, *63*, 41–55. https://doi.org/10.1016/j.cpr.2018.05.008

966     Gersick, C. J. (1988). Time and transition in work teams: Toward a new model of group

967          development. *Academy of Management Journal*, *31*, 9–41.

968          https://doi.org/10.5465/256496

969     Glowinski, D., Bracco, F., Chiorri, C., & Grandjean, D. (2016). Music ensemble as a resilient

970          system. Managing the unexpected through group interaction. *Frontiers in Psychology*, *7*.

971          https://doi.org/10.3389/fpsyg.2016.01548

972     Godfrey, R. (2016). Soldiering on: Exploring the role of humour as a disciplinary technology in

973          the military. *Organization*, *23*, 164–183. https://doi.org/10.1177/1350508414533164

974     Gomes, J. O., Borges, M. R. S., Huber, G. J., & Carvalho, P. V. R. (2014). Analysis of the

975          resilience of team performance during a nuclear emergency response exercise. *Applied*

976          *Ergonomics*, *45*(3), 780–788. https://doi.org/10.1016/j.apergo.2013.10.009

977 Grossoehme, D., & Lipstein, E. (2016). Analyzing longitudinal qualitative data: The application

978       of trajectory and recurrent cross-sectional approaches. *BMC Research Notes*, *9*(136).

979       https://doi.org/10.1186/s13104-016-1954-1

980 Gucciardi, D. F., Crane, M., Ntoumanis, N., Parker, S. K., Thøgersen-Ntoumani, C., Ducker, K.

981       J., Peeling, P., Chapman, M. T., Quested, E., & Temby, P. (2018). The emergence of team

982       resilience: A multilevel conceptual model of facilitating factors. *Journal of Occupational*

983       *and Organizational Psychology*, *91*, 729–768. https://doi.org/10.1111/joop.12237

984 Gucciardi, D. F., Hanton, S., Gordon, S., Mallett, C. J., & Temby, P. (2015). The concept of

985       mental toughness: Tests of dimensionality, nomological network, and traitness. *Journal of*

986       *Personality*, *83*, 26–44. https://doi.org/10.1111/jopy.12079

987 Gucciardi, D. F., Lang, J. W., Lines, R. L., Chapman, M. T., Ducker, K. J., Peeling, P., Crane, M.,

988       Ntoumanis, N., Parker, S. K., & Thøgersen-Ntoumani, C. (in press). The emergence of

989       resilience: Recovery trajectories in sleep functioning after a major stressor. *Sport,*

990       *Exercise, and Performance Psychology.* https://doi.org/10.1037/spy0000268

991 Gucciardi, D. F., Lines, R. L. J., Ducker, K. J., Peeling, P., Chapman, M. T., & Temby, P. (in

992       press). Mental toughness as a psychological determinant of behavioural perseverance in

993       Special Forces selection. *Sport, Exercise, and Performance Psychology*.

994       https://doi.org/10.1037/spy0000208

995 Gugerty, L. J. (1997). Situation awareness during driving: Explicit and implicit knowledge in

996       dynamic spatial memory. *Journal of Experimental Psychology: Applied*, *3*, 42–66.

997       https://doi.org/10.1037/1076-898X.3.1.42

998 Hackman, J. R. (2012). From causes to conditions in group research. *Journal of Organizational*

999       *Behavior*, *33*, 428–444. https://doi.org/10.1002/job.1774

1000 Hambrick, D. C. (2007). The field of management's devotion to theory: Too much of a good

1001   thing? *Academy of Management Journal*, *50*, 1346–1352.

1002   https://doi.org/10.5465/amj.2007.28166119

1003 Harrison, D. A., Price, K. H., Gavin, J. H., & Florey, A. T. (2002). Time, teams, and task

1004   performance: Changing effects of surface- and deep-level diversity on group functioning.

1005   *The Academy of Management Journal*, *45*, 1029–1045. https://doi.org/FILL DOI

1006 Hartmann, S., Weiss, M., Newman, A., & Hoegl, M. (2020). Resilience in the workplace: A

1007   multilevel review and synthesis. *Applied Psychology*, *69*, 913–959.

1008   https://doi.org/10.1111/apps.12191

1009 Hartwig, A., Clarke, S., Johnson, S., & Willis, S. (2020). Workplace team resilience: A

1010   systematic review and conceptual development. *Organizational Psychology Review*,

1011   *10*(3–4), 169–200. https://doi.org/10.1177/2041386620919476

1012 Haslam, S. A., & Van Dick, R. (2011). A social identity approach to workplace stress. In D. De

1013   Cremer, R. Van Dick, & K. Murnighan (Eds.), *Social psychology and organizations* (pp.

1014   325–352). Routledge. https://doi.org/10.4324/9780203846957-24

1015 Holmes, J. (2000). Politeness, Power and Provocation: How Humour Functions in the

1016   Workplace. *Discourse Studies*, *2*, 159–185.

1017   https://doi.org/10.1177/1461445600002002002

1018 Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From

1019   input-process-output models to IMOI models. *Annual Review of Psychology*, *56*, 517–

1020   543. https://doi.org/10.1146/annurev.psych.56.091103.070250

1021 Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of*

1022   *Management Review*, *31*, 386–408. https://doi.org/10.5465/amr.2006.20208687

1023    Kalisch, R., Cramer, A. O., Binder, H., Fritz, J., Leertouwer, Ij., Lunansky, G., Meyer, B.,

1024        Timmer, J., Veer, I. M., & Van Harmelen, A.-L. (2019). Deconstructing and

1025        reconstructing resilience: A dynamic network approach. *Perspectives on Psychological*

1026        *Science*, *14*, 765–777. https://doi.org/10.1177/1745691619855637

1027    Kalisch, Raffael., Baker, D., Basten, U., Boks, M., Bonanno, G., Brummelman, E., Chmitorz, A.,

1028        Fernandez, G., Fiebach, C., Galatzer-Levy, I., Geuze, E., Groppa, S., Helmreich, I.,

1029        Hendler, T., Hermans, E., Jovanovic, T., Kubiak, T., Lieb, K., Lutz, B., … Kleim, B.

1030        (2017). The resilience framework as a strategy to combat stress-related disorders. *Nature*

1031        *Human Behaviour*, *1*, 784–790. https://doi.org/10.17863/CAM.16856

1032    Karlsen, J. T., & Berg, M. E. (2020). A study of the influence of project managers' signature

1033        strengths on project team resilience. *Team Performance Management: An International*

1034        *Journal*, *26*(3/4), 247–262. https://doi.org/10.1108/TPM-12-2018-0081

1035    Klein, Katherine. J., & Kozlowski, S. W. (2000). From micro to meso: Critical steps in

1036        conceptualization and conducting multilevel research. *Organizational Research Methods*,

1037        *3*, 211–236. https://doi.org/10.1177/109442810033001

1038    Kozlowski, S. W., Chao, G. T., Gr, J. A., Braun, M. T., & Kuljanin, G. (2013). Advancing

1039        multilevel research design: Capturing the dynamics of emergence. *Organizational*

1040        *Research Methods*, *16*, 581–315. https://doi.org/10.1177/1094428113493119

1041    Kozlowski, S. W., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams.

1042        *Psychological Science in the Public Interest*, *7*, 77–124. https://doi.org/10.1111/j.1529-

1043        1006.2006.00030.x

1044    Kozlowski, Steve W. J., Chao, G. T., Grand, J. A., Braun, M. T., & Kuljanin, G. (2016).

1045        Capturing the multilevel dynamics of emergence: Computational modeling, simulation,

and virtual experimentation. *Organizational Psychology Review*, *6*, 3–33.

https://doi.org/10.1177/2041386614547955

Kozlowski, S.W.J., & Klein, K. J. (2000). A multilevel approach to theory and research in

organizations: Contextual, temporal, and emergent processes. In K.J. Klein & S. W. J.

Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations:*

*Foundations, extensions, and new directions* (pp. 3–90). Jossey-Bass.

Kwon, S.-W., & Adler, P. S. (2014). Social capital: Maturation of a field of research. *Academy of*

*Management Review*, *39*, 412–422. https://doi.org/10.5465/amr.2014.0210

Luhmann, M., Fassbender, I., Alcock, M., & Haehner, P. (2020). A dimensional taxonomy of

perceived characteristics of major life events. *Journal of Personality and Social*

*Psychology*, No Pagination Specified-No Pagination Specified.

https://doi.org/10.1037/pspp0000291

Magee, J. C., & Tiedens, L. Z. (2006). Emotional ties that bind: The roles of valence and

consistency of group emotion in inferences of cohesiveness and common fate.

*Personality and Social Psychology Bulletin*, *32*, 1703–1715.

https://doi.org/10.1177/0146167206292094

Malterud, K. (2016). Theory and interpretation in qualitative studies from general practice: Why

and how? *Scandinavian Journal of Public Health*, *44*, 120–129.

https://doi.org/10.1177/1403494815621181

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in

uses of humor and their relation to psychological well-being: Development of the Humor

Styles Questionnaire. *Journal of Research in Personality*, *37*, 48–75.

https://doi.org/10.1016/S0092-6566(02)00534-2

McComb, S. A. (2008). Shared mental models and their convergence. In N. W. Warner, C. A. P.

        Smith, & M. P. Letsky (Eds.), *Macrocognition in teams: Theories and methodologies* (pp.

        35–52). Ashgate. https://doi.org/10.1201/9781315593166-3

McCulloch, P., Mishra, A., Handra, A., Dale, T., Hirst, G., & Catchpole, K. (2009). The effects of

        aviation-style non-technical skills training on technical performance and outcome in the

        operating theatre. *Quality and Safety in Healthcare*, *18*, 109–115.

        https://doi.org/10.1136/qshc.2008.032045

Mesmer-Magnus, J., Glew, D. J., & Viswesvaran, C. (2012). A meta-analysis of positive humor

        in the workplace. *Journal of Managerial Psychology*, *27*, 155–190.

        https://doi.org/10.1108/02683941211199554

Mohammed, S., Hamilton, K., Sánchez-Manzanares, M., & Rico, R. (2017). Team Cognition:

        Team Mental Models and Situation Awareness. In E. Salas, R. Rico, & J. Passmore

        (Eds.), *The Wiley-Blackwell handbook of the psychology of team working and*

        *collaborative processes* (pp. 369–392). Hoboken Wiley-Blackwell.

Moran, C. C., & Hughes, L. P. (2006). Coping with stress: Social work students and humour.

        *Social Work Education*, *25*, 501–517. https://doi.org/10.1080/02615470600738890

Morgan, P., Fletcher, D., & Sarkar, M. (2013). Defining and characterizing team resilience in

        elite sport. *Psychology of Sport & Exercise*, *14*, 549–559.

        https://doi.org/10.1016/j.psychsport.2013.01.004

Morgan, P., Fletcher, D., & Sarkar, M. (2015). Understanding team resilience in the world's best

        athletes: A case study of a rugby union World Cup winning team. *Psychology of Sport &*

        *Exercise*, *16*, 91–100. https://doi.org/10.1016/j.psychsport.2014.08.007

1091    Morgan, P., Fletcher, D., & Sarkar, M. (2017). Recent developments in team resilience research

1092          in elite sport. *Current Opinion in Psychology*, *16*, 159–164.

1093          https://doi.org/10.1016/j.copsyc.2017.05.013

1094    Morgan, P., Fletcher, D., & Sarkar, M. (2019). Developing team resilience: A season-long study

1095          of psychosocial enablers and strategies in a high-level sports team. *Psychology of Sport &*

1096          *Exercise*, *45*, 101543. https://doi.org/10.1016/j.psychsport.2019.101543

1097    Nicholls, D. (2009). Qualitative research: Part one – Philosophies. *International Journal of*

1098          *Therapy and Rehabilitation*, *16*, 526–533. https://doi.org/10.12968/ijtr.2009.16.10.44562

1099    Nicolaides, V. C., LaPort, K. A., Chen, T. R., Tomassetti, A. J., Weis, E. J., Zaccaro, S. J., &

1100          Cortina, J. M. (2014). The shared leadership of teams: A meta-analysis of proximal,

1101          distal, and moderating relationships. *The Leadership Quarterly*, *25*, 923–942.

1102          https://doi.org/10.1016/j.leaqua.2014.06.006

1103    Ployhart, R. E., Nyberg, A. J., Reilly, G., & Maltarich, M. A. (2014). Human capital is dead; long

1104          live human capital resources! *Journal of Management*, *40*, 371–398.

1105          https://doi.org/10.1177/0149206313512152

1106    Prince, C., Ellis, E., Brannick, M. T., & Salas, E. D. (2007). Measurement of team situation

1107          awareness in low experience level aviators. *The International Journal of Aviation*

1108          *Psychology*, *17*, 41–57. https://doi.org/10.1080/10508410709336936

1109    QSR International Pty LTD. (2010). *NVivo Qualitative Data Analysis Software* (Version 12)

1110          [Computer software].

1111    Razinskas, S., & Hoegl, M. (2020). A multilevel review of stressor research in teams. *Journal of*

1112          *Organizational Behavior*, *41*(2), 185–209. https://doi.org/10.1002/job.2420

1113    Robert, C., & Wilbanks, J. E. (2012). The Wheel Model of humor: Humor events and affect in

1114        organizations. *Human Relations*, *65*, 1071–1099.

1115        https://doi.org/10.1177/0018726711433133

1116    Salas, E. D., Cooke, N. J., & Rosen, M. A. (2008). On teams, teamwork, and team performance:

1117        Discoveries and developments. *Human Factors: The Journal of Human Factors and*

1118        *Ergonomic Society*, *50*, 540–547. https://doi.org/10.1518/001872008X288457

1119    Salas, E. D., Reyes, D. L., & McDaniel, S. H. (2018). The science of teamwork: Progress,

1120        reflections, and the road ahead. *American Psychologist*, *73*, 593–600.

1121        https://doi.org/10.1037/amp0000334

1122    Saldaña, J. (2003). *Longitudinal Qualitative Research: Analyzing Change Through Time*.

1123        Rowman Altamira.

1124    Salmon, P. M., Stanton, N. A., Walker, G. H., Jenkins, D., Ladva, D., Rafferty, L., & Young, M.

1125        (2009). Measuring situation awareness in complex systems: Comparison of measures

1126        study. *International Journal of Industrial Ergonomics*, *39*, 490–500.

1127        https://doi.org/10.1016/j.ergon.2008.10.010

1128    Schoenewolf, G. (1990). Emotional contagion: Behavioral induction in individuals and groups.

1129        *Modern Psychoanalysis*, *15*, 49–61.

1130    Shuffler, M. L., & Carter, D. R. (2018). Teamwork situated in multiteam systems: Key lessons

1131        learned and future opportunities. *American Psychologist*, *73*, 390–406.

1132        https://doi.org/10.1037/amp0000322

1133    Sparkes, A., & Smith, B. (2014). *Qualitative research methods in sport, exercise and health:*

1134        *From process to product*. Routledge.

1135    Stanton, N. A., Salmon, P. M., Walker, G. H., Salas, E. D., & Hancock, P. A. (2017). State-of-

1136        science: Situation awareness in individuals, teams and systems. *Ergonomics*, *60*, 449–

1137        466. https://doi.org/10.1080/00140139.2017.1278796

1138    Stanton, N. A., Stewart, R., Harris, D., Houghton, R. J., Baber, C., McMaster, R., Salmon, P.,

1139        Hoyle, G., Walker, G., Young, M. S., Linsell, M., Dymott, R., & Green, D. (2006).

1140        Distributed situation awareness in dynamic systems: Theoretical development and

1141        application of an ergonomics methodology. *Ergonomics*, *49*, 1288–1311.

1142        https://doi.org/10.1080/00140130600612762

1143    Stoverink, A. C., Kirkman, B. L., Mistry, S., & Rosen, B. (2020). Bouncing Back Together:

1144        Toward a Theoretical Model of Work Team Resilience. *Academy of Management Review*,

1145        *45*(2), 395–422. https://doi.org/10.5465/amr.2017.0005

1146    Talat, A., & Riaz, Z. (2020). An integrated model of team resilience: Exploring the roles of team

1147        sensemaking, team bricolage and task interdependence. *Personnel Review*, *ahead-of-

1148        print*(ahead-of-print). https://doi.org/10.1108/PR-01-2018-0029

1149    Tasa, K., Taggar, S., & Seijts, G. H. (2007). The development of collective efficacy in teams: A

1150        multilevel and longitudinal perspective. *Journal of Applied Psychology*, *92*, 17–27.

1151        https://doi.org/10.1037/0021-9010.92.1.17

1152    Temby, P., & Vozzo, J. (2017). Understanding team resilience in the Australian Army: A

1153        qualitative study. *Journal of Science and Medicine in Sport, 20*, S51-S52.

1154        https://doi.org/10.1016/j.jsams.2017.09.162

1155    Tracy, S. J. (2010). Qualitative quality: Eight "big-tent" criteria for excellent qualitative research.

1156        *Qualitative Inquiry*, *16*, 837–851. https://doi.org/10.1177/1077800410383121

1157    Tuckman, B. W. (1965). Developmental sequence in small groups. *Psychological Bulletin*, *63*,

1158          384–389. https://doi.org/10.1037/h0022100

1159    Van der Kleij, R., Molenaar, D., & Schraagen, J. M. (2011). Making teams more resilient: Effects

1160          of shared transformational leadership training on resilience. *Proceedings of the Human*

1161          *Factors and Ergonomics Society*, *55*, 2158–2162.

1162    van Kleef, G. A., & Fischer, A. H. (2016). Emotional collectives: How groups shape emotions

1163          and emotions shape groups. *Cognition and Emotion*, *30*, 3–19.

1164          https://doi.org/10.1080/02699931.2015.1081349

1165    Waring, S., Alison, L., Carter, G., Barrett-Pink, C., Humann, M., Swan, L., & Zilinsky, T. (2018).

1166          Information sharing in interteam responses to disaster. *Journal of Occupational and*

1167          *Organizational Psychology*, *91*(3), 591–619. https://doi.org/10.1111/joop.12217

1168    Whetten, D. A. (2009). An examination of the interface between context and theory applied to

1169          the study of Chinese organizations. *Management and Organization Review*, *5*, 29–55.
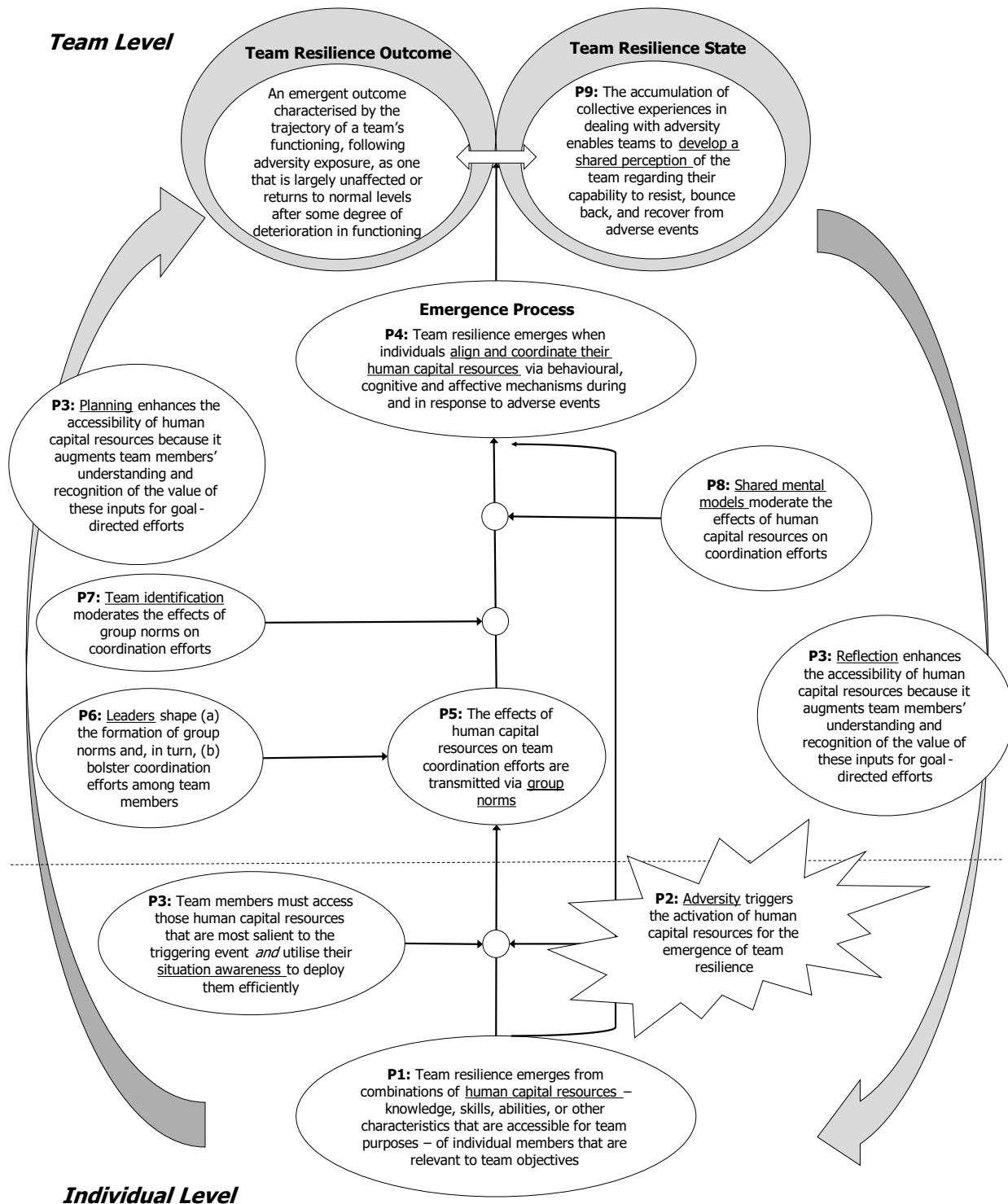
1170          https://doi.org/10.1111/j.1740-8784.2008.00132.x

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Figure 1. Conceptual model of team resilience emergence including key propositions (adapted from Gucciardi et al., 2018).

## Themes | Nodes | Representative Quotes | Temporal Theme

**Theme:** Adversity is an enduring, shared experience of an event that is underpinned by our drive to succeed and may emanate from our group

Nodes:
- Adversities are likely expected and within our coping ability
- Adversity is shared in nature and experienced as a team
- Adversity may emanate from our group dynamic
- Complex team tasks as an adversity
- Long term physical strain acts as an adversity
- Self pressure from fear of removal from the course
- The pressure of assessment acts as adversity
- Uncertainty as an adversity

Representative Quotes:

Everyone is obviously on a level when it comes to a problem or something like that, one person sees something that's quite a large event (e.g., enemy threat); I think every person is thinking the same thing in your team. [Time point 1]

Adversities tend to be individual but everyone experiences them as a team. So like everyone's under the pressure of assessment and the pressure from themselves to not get themselves in s**t with the DS [directing staff]. [Time point 1]

I think especially for the older guys I just know it's going to be s***ty time, you're going to be cold, you're going to be hungry, you're going to be doing six hours on in high seas, you're going to be uncomfortable. [Time point 2]

Temporal Theme: An increase in the frequency and complexity of adversities is coupled with a reduced perception of control across time.

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**Theme:** Individuals recognise adversity through physiological and/or behavioural states

Nodes:
- We can recognise personal responses to adversity and react
- We can recognise experiences of adversity in others
- We identify team level changes in responses to adversity

Representative Quotes:

You can feel when your heart rate's going up, or when something's about to hit, or you're about to do a jump or something. When your heart's literally beating through your chest... just through [as a response to] your stressors, it's going up. [Time point 1]

Temporal Theme: Internal and external sources of information become dominant in allowing a team to recognise adversity.

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**Theme:** Social resources bind together individual self-regulatory capacities when confronted with adversity to support team functioning

Nodes:
- Experience of applying skills to deal with adversity
- Holding skills to regulate emotional state during adversity is key
- Individual resilience to perform under adversity
- Maintaining or quickly regaining focus during adversity
- Understanding adversities and rationalising experiences
- High levels of motivation to succeed at the individual level
- Maintaining individual situational awareness during adversity
- Mastery orientated mindset
- Prosocial characteristics of the individual support functioning

Representative Quotes:

Especially, that adversity, even prepping for something, everyone's helping the same, filling those gaps, helping each other, even before you step out the door. When you're out the door, everyone's helping. You're still performing, performing, performing, 'til the job's finished. And then it's still not just switch off. It's still help everyone out, prep your kit, and get ready again. [Time point 1]

I think almost the worst situation you could get was where no one spoke about it, but [the team] knew that guy was about to get cut (removed from the course). They weren't going to help him or give him any additional help, they felt they couldn't. And that guy was just a nightmare and he was on the way out. [Time point 2]

Temporal Theme: The importance of individual capacities for resilient functioning is dependent upon the composition of the team.

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**Theme:** Shared experiences of adversity and collective structures strengthen social bonds and mental models needed for team resilience emergence

Nodes:
- Clear but flexible roles and responsibilities
- Shared or flexible leadership structure
- Shared past experience supports team resilience
- Team identity; knowing who we are and wanting to achieve together
- Understanding each other's behaviours and the ideal shared end state is important

Representative Quotes:

Everyone kind of here has been selected by their leadership ability as well, so even when we do come in groups and there is a leader, everyone in their own right has shown leadership to be where they are. So essentially the leader of the group can also take on board suggestions and all that sort of stuff from everyone rather than just saying what he says goes. [Time point 1]

Temporal Theme: The flexibility of our roles and refinement of mental models foster adaptive processes to adversity.

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**Theme:** Behavioural processes and shared states are how collectives turn individual and team capacities into performance under adversity

Nodes:
- Cohesiveness of team is important
- Positive affective state is important to demonstrate resilience
- Shared confidence in team to perform following adversity
- Trust between teammates
- Planning and reviewing underpin regulatory processes in the moment
- Effective coordinating of team behaviours, focus and emotions by leader
- Performance rate adaptation to mitigate the effect of adversity
- Proactive interdependent behaviours support coping with adversity
- Communication is key to our performance under adversity
- Use of humour to maintain positive affective state

Representative Quotes:

…once that first person makes that decision then everyone else can start to understand what they're doing, then everyone else will start to work off that. And then as a team you'll start making those decisions, and understanding what the play is [Time point 2]

Yeah, I think that small team environments sort of been harped on the whole time we've been here, so you have to get used to that. And if you're not, then we need to be. You need to be used to that, everyone needs to be in sync, everyone needs to be happy and healthy otherwise it just won't work. It'll fall apart. So I think everyone's good here at picking guys up, making sure everyone can keep performing in the situation. [Time point 1]

Temporal Theme: Team processes and past experience foster the development of shared states that protect collective functioning.
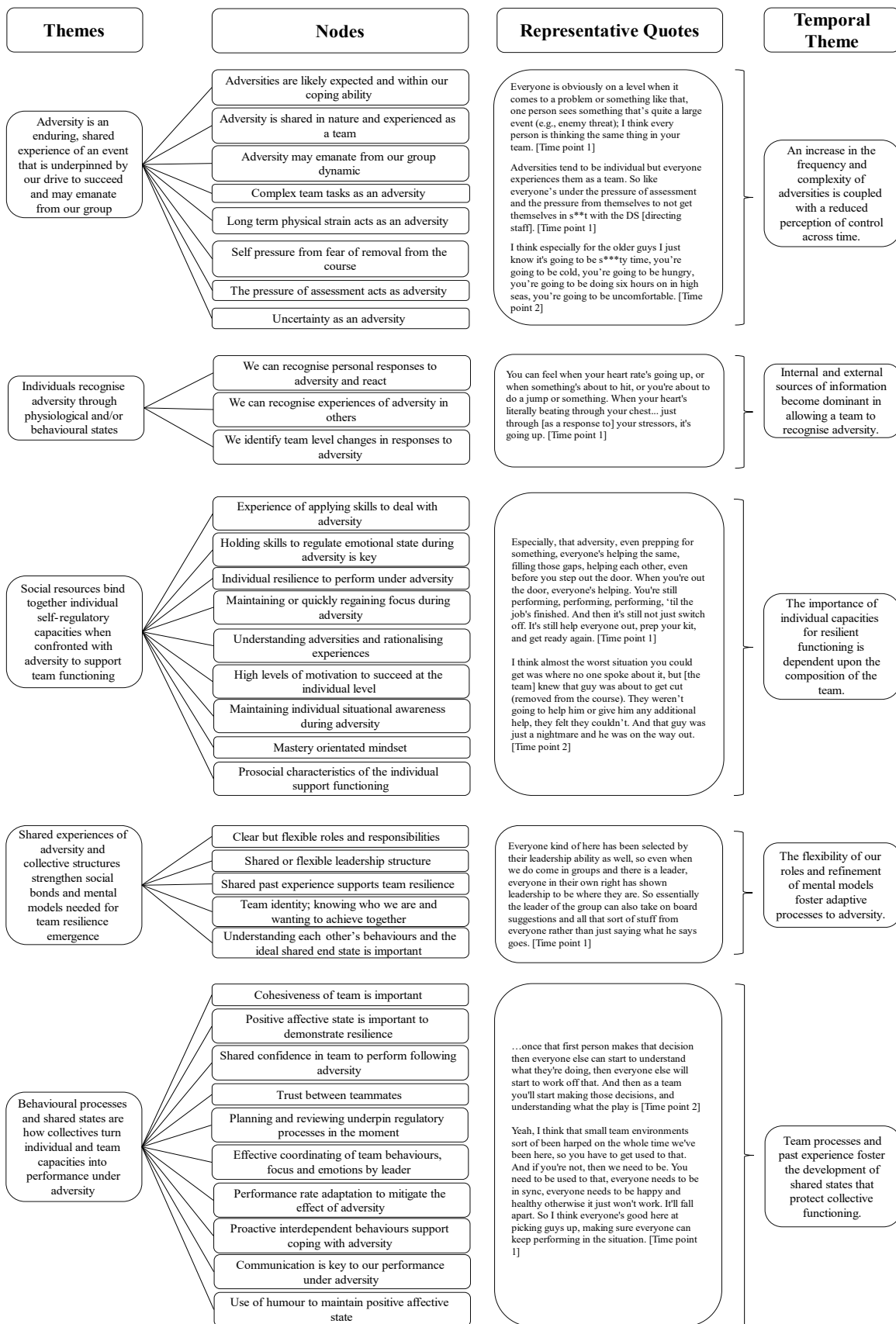
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Figure 2. Overview of cross-sectional and longitudinal theme structure with representative quotes.

# Interview Guide

Interviewer: Thanks for taking the time out for your course to sit down with us to share your perceptions of team resilience as it has unfolded over the first half of your training program/since we last spoke. By team resilience, we mean sustaining optimal levels of collective functioning or recovering quickly after some degree of deterioration when confronted with adversity. In other words, we're interested in the trajectories of team performance before, during, and after a team has experienced some type of adversity. By adversity, we mean an event or situation that posed substantial threat to the collective functioning of your patrol. The adversity might be something that was experienced directly by one member only, like an injury – yet has the potential to affect the functioning of the team. Or, the adversity could be something that the team as a whole experienced simultaneously, like equipment failure that disrupts communication channels between members.

## Setting the Scene
1. Can you describe for me an adversity that your patrol has experienced so far on the training program/since we last spoke?
    a. Is the experience the same or different for each team member? How so?
2. How did you as an individual / team know there was a substantial threat to the optimal functioning of your team? [*Probes*: what did you see, hear, etc? How did the situation change?]
3. How well did your patrol deal with this adversity? [*Probe*: ask them to focus on the objective of the mission – did your patrol sustain performance or deteriorate in some way but bounce back quickly?]
4. What factors do you believe played a key role in your patrol sustaining performance / bouncing back quickly? [*Note*: refer to the performance trajectory noted in response to Q3]
5. What did you learn from this experience with adversity that will help you as an individual working in teams in the future / your team's future experiences with adversity?

Interviewer: Thanks for your insights so far. You may have noticed some repetition in the surveys you have completed for us. These surveys focus on several key factors that we believe play an important role in team resilience. In the following section of the discussion, we want to gather your perspectives on these factors.

## Shine a Spotlight on the Guiding Conceptual Model of Team Resilience
6. How did your patrol make use of the knowledge, skills, and attributes of individual members to deal with the adversity?
7. Was the adversity something your patrol expected to occur, or was it unexpected? [*Probe*: in other words, did you consider the adversity as part of your planning?]
    a. If the adversity was expected => how did you plan in advance to deal with that adversity? Did these plans align with what you actually did?
    b. If the adversity was unexpected => did your patrol reflect on the adversity experience at some point to gather learning points?
8. Coordination among team members is critical in any sort of group-based activity. How well did your patrol coordinate in response to the adversity? [*Probe*: behaviourally, cognitively, emotionally – which type(s) were most important?]
9. With teams, norms represent how members are expected to think and act. To what extent did norms play a role in your patrol's response to the adversity?
10. How did leadership play a role in your patrol's response to the adversity? [*Probe*: what did he do, say, etc?]
11. There is a classic saying, "great minds think alike", which is super important for team performance. To what extent did each member's knowledge of the situation and task at hand align with other members? [Probe: how did this degree of overlap affect your performance?]

12. Has your team's experience with this adversity affected your belief in your patrol's ability to deal effectively with future adversities? How so?

**Looking Forward**
13. What do you expect will be the main adversities that you will experience on [name of major course blinded because it will identify the participant sample]? [*Probe*: you might consider adversities that are experienced directly one member, some but not all, or the entire team]
    a. [*if time permits*] How might your patrol go about dealing with these adversities?

**Ending Question**
14. Is there something we haven't asked you that believe is relevant to team resilience?

Interviewer: Thank the participants for their time and sharing their perspectives of these questions.