1   **Stress Adaptation and Resilience of Academics in Higher Education**

2   **Abstract**

3   Academics in higher education across the globe indicate high levels of stress from multiple

4   sources. The COVID-19 pandemic has intensified stress. Adaptation and resilience are needed

5   if academics, particularly those focussed on education and teaching, are to endure, learn and

6   "bounce back" from this era of stress and contribute to education quality and student learning.

7   This review is organised to answer two key questions. First, what are the main forms of stress

8   on academics especially those focussed on education and teaching? Second, what are the

9   responses of academics to stress, and can the concept of resilience be used to understand the

10 consequences for academic careers focussed on education and education quality? To answer

11 these questions, we first critically review the literature on the responses of academics to stress

12 and the concept of resilience which has been used by multiple disciplines including teacher

13 education. We then broadly define the resilience of academics as their capacity to learn

14 from and adapt to stress and maybe less about individual personality characteristics and

15 more dependent on the relational aspect of the socio-ecological higher education ecosystem.

16 There are, however, limits to resilience and potential flow on effects to education quality and

17 student learning. Given the adverse operating environment for higher education and the

18 significant contributions of academics to the knowledge economy and graduate quality,

19 understanding and building the resilience of academics to adapt and succeed has never been

20 more important.

21 Total Words 235 words

22

23 **Introduction**

24 Higher education worldwide is in an era of substantial change (OECD, 2003). The COVID-19

25 pandemic, with the rapid change to online learning, has accelerated change and intensified

26 stress by closing international borders. The travel restrictions triggered by the COVID-19

27 pandemic has significantly impacted university finances, causing academic redundancies and

28 job losses (Crawford et al., 2020; Cohrssen et al., 2022; De los Reyes et al., 2021, 2022;

29 Mahat et al., 2022a,b; Mercado, 2020; Mok et al., 2020; OCED, 2021; Rapanta et al.,

30 2020). Even before the COVID-19 pandemic, increasingly regulatory approaches by

31 government including systemic assessments of research and reviews of education quality

32 (Locke, 2012; 2014; Teichler et al., 2013), have led to organisational structural reforms in

33 higher education. This reform led to the emergence and increasing dominance of executive

34 leadership, the transformation of governing bodies into corporate boards, the weakening of

35 disciplines and departments by the creation of schools, the concentration of research into

36 research centres and differentiation of the academic role with the establishment of education

37 or teaching focussed academics (Krause, 2020; Locke, 2014; Marginson, 2000; 2007; Ross,

38 2019; Ross et al., 2022). Since then, executive leadership have shaped higher education into

39 a more corporate enterprise, altered the academic workforce, centralised decision making and

40 used faculty and curriculum restructures to find efficiencies and cost savings. This more

41 corporate approach has widened the differences in values between the executive leadership

42 and academics, created conflict and caused constraints on academic work (Winter &

43 O'Donohue, 2012). Concern over constraints on academic work have led to worrying

44 predictions about the impacts of this more corporate enterprise on knowledge creation,

45 education quality and academic freedom (French, 2019; Marginson, 2000; 2007;

46 Weatherson, 2018). Well before the COVID-19 pandemic, almost two decades ago the

47 consequence of such differences was described as a "destructive standoff… between

48 traditional academic cultures and modernising corporate cultures" (Marginson, 2000 p. 29).

49 The present-day standoff between executive leadership and academics continues with an end

50 date unknown.

51 Given the importance of universities to economies (Valero & Van Reenen, 2019) it is important

52 that we have a better understanding of responses of academics to the change which has

53 occurred and will be a feature of higher education for the foreseeable future. A better

54 understanding of the responses of academics to stress, will enable strategies and tools to be

55 developed to allow academics to respond to the adversity more positively, especially for

56 those Early Career Academics (ECAs) who are just starting out and education focussed

57 academics who are still finding their way in this rapidly changing landscape. The concept of

58 resilience may allow academics to better reach their potential and deliver on expectations of

59 high-quality contributions in education and discipline-based research. Given the further

60 uncertainty and change looming for higher education, resilience is critical for academics and

61 higher education if they are to persist and create solutions to the challenges which the planet

62 faces such as COVID-19 (Mahat et al., 2022a) and realise the educational sustainability

63 development goals (OECD, 2021).

64

65 **The key questions**

66 This review is organised to answer two key questions. First, what are the main forms of stress

67 on academics, especially those focussed on education and teaching in the contemporary higher

68 education ecosystem, pre and post COVID-19? We answer this by summarising the origins

69 and main sources of stress on academics. Second, what are the responses of academics to

70 stress, and can the concept of resilience be used to understand the consequences for academic

71 careers? To answer this, we review the literature on the responses of academics to stress

72 including teacher education. Then we provide a conceptual framework of resilience which

73 describes how higher educational leaders can implement strategies to reduce the magnitude

74 and time of recovery from the impact of stress on academics so they can learn from and

75 adapt to stress. Finally, we offer solutions to build resilience of academics because of the

76 potential negative effects of stress on the retention of vulnerable Early Career Academics

77 (ECAs) and education focussed academics and the flow on effects to students and education

78 quality. Understanding and building resilience of academics at various levels in the higher

79 education ecosystem is important. If the resilience and adaptive capacity of academics can

80 be strengthened, then it is more likely there will be positive impacts on the resilience of

81 students, improved research and education quality and increased trust in the wider democratic

82 practices of higher education ecosystems.

83 **Literature Review**

84 This literature review is a critical narrative review; one of the main literature review types

85 (Green et al., 2006). The aim was to identify and comprehensively review the most significant

86 ideas on resilience within and across fields and unite them in a narrative, conceptual synthesis.

87 As is typical of critical narrative reviews it involved a non-systematic search (Green et al.,

88 2006) and compilation of main ideas from several areas and disciplines which have

89 investigated stress and resilience from educational psychology to ecology. A critical narrative

90 review is an ideal form of literature review to combine novel ideas across fields. The key

91 benefits of the approach are the ability to cast a wider scope in the pursuit of novel

92 conceptual synthesis and insight (Baethge et al., 2019). The decision to use this form of review

93 was an explicit one because this allowed a summary of the literature in a way which is not

94 explicitly systematic (Baethge et al., 2019; Green 2006). Although critical narrative reviews

95 have been criticised (Green et al., 2006), they have the major benefit of reduced risk of bias

96 when collating the sum-total evidence on a topic. The review of the literature included

97 databases such as ERIC (Educational Resources Information Centre) for literature on teacher

98 resilience, the Ecology and Society organisation for literature on ecological resilience and the

99 American Psychological Association (Psyc.Net) for literature on psychological resilience.

100 Additionally key literature on stress and resilience with citation rates of around 10,000 were

101 included from ecological and psychological fields.

102

1. Sources of Stress on Academics

Even prior to the COVID-19 pandemic, academics across the globe indicated escalating workloads and high levels of stress in research and teaching (Winefield & Jarrett, 2001). Origins of stress on academics are proximal and distal. Proximal origins of stress for academics arise from the immersion in a hypercompetitive environment where rejection and criticism are part of everyday life. In more recent times, increasing stress on academics also occurs from predatory journals and conference organisers, which add to an already overwhelming email correspondence. Distal origins of stress for academics arise from decisions made by executive leaders and governments which cascade down onto academics. These distal origins of stress on academics include increasing pressure on academics to take on more teaching of greater number and diversity of students, decreasing funding, reduced opportunities for research (disciplinary or education) and increasing and more complex forms of contract cheating and concomitant breaches in academic integrity. As executive leaders try to save costs and increase efficiencies, academics also experience increasing administration workloads from change management plans which reduce or redeploy professional staff centrally, decreasing casual budgets, increasing faculty restructures and curriculum revisions to designed to better match changing and competitive markets for students (Bone & Ross, 2021; Krause, 2020; Whitchurch & Gordon, 2013). Academics also experience increasing stress with expectations to learn new technologies at a rapid pace and from digital transformations not solely arising from COVID-19 (Watermeyer et al., 2021a,b). Moreover, stress arises when the values and beliefs of academics are in conflict with executive leaders whose priorities appear to be geared more towards the economic bottom line rather than the academic and education enterprise (Carson et al., 2013; Chan et al., 2020; Day, 2011; Erikson et al., 2020; Winefield et al., 2008; Winter, 2009; Winter and O'Donohue, 2012). Added on top of these significant stressors, has been the COVID-19 pandemic.

The COVID-19 pandemic has been an acute and intensive stress and, for many academics on the front line of the COVID-19 pandemic delivery, had severe consequences for work-life balance and productivity (Crawford et al., 2020; Mahat et al., 2022; Mercado, 2020; Mok et al., 2020; Peters et al., 2020; Rapanta et al., 2020).

Chronic stress experienced by academics include criticisms and rejection of manuscripts, research grants, and promotion applications and criticisms from peers, potentially negative judgements of teaching in student evaluations from students, increasing academic workloads, the widening gap in values between academics and higher education leadership, changes and reform of the academic role and on-going tensions between academics and professional

137 administrators (Chan et al., 2020; Day, 2011; Del Favero & Bray, 2010; Lee et al., 2021;

138 Ross et al., 2022; Whitchurch, 2019; Winter & O'Donohue, 2012).

139 Rejection of manuscripts and grant applications by peers has significant impacts on academics

140 because their raison d'être is enhancing understanding and developing the field or sub

141 discipline and to do this they need to publish and bring in grant income. Rejection of

142 manuscripts and grants by peers can also be seen as synonymous with rejection from the social

143 circle of successful academics (Day, 2011). Even when rejections do not occur, peer reviews

144 can still be damaging to academic self-efficacy when the language is harsh and the tone

145 demeaning (Clements, 2020). Clements (2020), states that the peer review process is "… rife

146 with unnecessary, personal comments that merely served as subjective criticisms of the authors'

147 competencies, …… implying that the authors themselves were illogical and unintelligent" (p.

148 472). Such personal comments used to describe the limitations of research, can also entrench

149 disadvantages for certain groups (Silbiger & Stubler, 2019) and are unnecessary when more

150 reasonable and constructive criticism can be used.

151 Another chronic source of stress for academics is student evaluations of teaching. The origins of

152 student evaluations of teaching date back to the 1920s (Marsh, 1980; 1981; 1982; 1984;

153 1987; Marsh & Bailey, 1993 and reviews within), with the development of the Students'

154 Evaluation of Educational Quality (SEEQ). While student evaluations are called different

155 names depending on the institution and context, the purpose of student evaluations is to

156 provide academics with the feedback they need to evaluate teaching effectiveness so they

157 can understand what has worked, what has not worked and what needs to change. Student

158 evaluations were also created so that administrators could help subsequent students decide

159 which units to take. Student evaluations were designed to be a reliable and valid multi-

160 dimensional construct, able to match with the complex multi-dimensional nature of teaching and

161 provide academics with feedback on their teaching from students for evaluating effectiveness

162 relative to others (Roche and Marsh, 2000). For example, a teacher may be passionate but

163 not well organised, or be able to explain concepts well, but assessment and feedback may

164 need improvement. As Roche and Marsh (2000) state "helping people to believe in themselves

165 is often considered to be the most important, but also the most challenging, aspect of fostering

166 successful outcomes in many settings" (p. 439). Criticisms and judgements from colleagues,

167 peers, and students, can lead to social rejection, isolation and hyper vigilance with constant

168 checking for possible threats (Gornall, 2012). Criticism and negative judgements made by the

169 government and the community who view higher education as not delivering on their

170 expectations are also powerful.

171   Further sources of chronic stress are increasing academic workloads. Reports commissioned by
172   academic unions have found evidence that 90% of academics work greater than the allocated
173   hours they are paid for (Winefield et al., 2008; Strachan et al., 2012), and even before the
174   COVID-19 pandemic excessive workloads were linked to declines in academic mental health
175   and wellbeing. There are no longer peaks and troughs of work which continues relentlessly
176   throughout the year (Morrish, 2019). Even those academics who do not have research in their
177   academic role are expected to contribute to scholarship or the governance of the university.
178   Work intensification, where the "amount of work to be done in a fixed time and the time
179   pressure experienced to undertake and complete that work has increased i.e. how hard and
180   fast an employee is working in any given period" (Fein et al., 2017, p. 361) has also become
181   a feature of academic work (Lee et al., 2021). Further the type of work done by academics
182   is increasingly constrained and dependent on university strategic plans. Only those academics
183   with significant research funding still have the freedom and flexibility to choose work in an
184   area of interest (Chan et al., 2020; Gornall, 2012). Workload models are found in almost all
185   institutions where teaching and student contact hours and supervision are tallied, but which do
186   not account for the actual time work tasks take to complete and this leads to demotivation
187   (Vardi, 2009). Paradoxically, while surveillance of academics is increasing (Karlsen, 2013)
188   and "presenteeism" expected, many academics do "unseen" work; a compulsive form of
189   "hyper professionality" where they are always working and always electronically connected
190   (Gornall, 2012 p. 150).

191

192   The widening gap in values between academics and the more corporate approach of
193   executive leadership to workload stress. Studies have found that academics share a deep-
194   seated antipathy to the corporatisation of universities (Winter & O'Donohue, 2012). Winter &
195   O'Donohue (2012) surveyed over 952 teaching and research academics at levels up to
196   professor and found that academic values were first and foremost aligned to universities as
197   places of intellectual rigour; the primary purpose of academic work being to encourage
198   student learning and scholarship. Winter & O'Donohue (2012) also found academics were
199   divided into those who "will" and those who "won't" be "managed professionals" (Rhoades,
200   1998).

201   Academics are also under pressure because of educational reform of the academic role (Ross,
202   2019; Ross et al., 2022). Numerous studies across the globe provide evidence of the changing
203   nature of both the academic role and higher education more broadly (Bexley et al., 2011;
204   Coates, 2009; James et al., 2013; Locke, 2014; Marini et al., 2019; Teichler et al., 2013).
205   Over the last decade there has been differentiation of the higher education workforce and

206 academics have been encouraged to target specific activities (Whitchurch, 2019).
207 Stratification is also occurring at a whole of university level, between academics in different
208 types of institutions (i.e. research intensive versus others), mode of employment (i.e. part time
209 and full time permanent and fixed term), between disciplinary groupings and between para
210 academics and academics (Locke, 2014). There has also been an increase in and diversity of
211 the profession, academics who have entered from professional practitioner-based disciplines
212 (e.g. law and health) and the emergence of professional staff with specific specialist functions
213 such as education, finance, marketing, recruitment and student services appointed on the basis
214 of external experience in a wide range of sectors (Whitchurch, 2019). Education focussed
215 academics are increasingly a feature of the higher education landscape even in research
216 intensive universities (Bentley et al., 2013; Coates & Goedgegebuure, 2012; James et al.,
217 2013). Education focussed academics are under pressure because of uncertain career
218 trajectories and lack of value in a higher education which values disciplinary reach (Ross,
219 2022). Even higher education leaders are unsure and yet are using these academics as
220 agents of institutional change (Henkel, 2002; 2005) to deliver on societal expectations of
221 graduate employment (Chandler et al., 2002; Deem et al., 2008; Deem 2016; Diefenbach &
222 Klarner, 2008; Hill, 2012).

223 These changes have occurred not without tensions (Bentley et al., 2013; Dobson, 2000). A
224 major source of stress for academics in higher education is also the often-fractious relationship
225 between academics and professional administrators (Del Favero & Bray, 2010). Del Favero &
226 Bray (2010) describe a higher education system with contentious relationships between top-
227 down administrators and academics. Tensions between academics and administrators arise
228 over who has the greatest influence, authority and right to make decisions, and these express
229 themselves in a lack of trust (Bone & Ross, 2021; Del Favero & Bray, 2010; Jones, 2012).
230 Raised apprehension and eroded trust between academics and administrators has become a
231 feature of higher education (Del Favero & Bray, 2010). The root of this tension is structural
232 and cultural. Structurally, the increase in the variety and number of administrative staff raises
233 concerns that this has come at the cost of academic positions. Culturally, administrators are
234 seen to cultivate a managerial climate characterised by restructures, influenced by external
235 demands of accreditation bodies and graduate demands for employability rather than a
236 focus on academics and disciplines. Reasons for the cultural clash between administrators and
237 academics is perhaps motivated by administrators' collective responsibility to their institutions
238 compared to academics being motivated by their individual scholarly pursuits (Del Favero &
239 Bray, 2010). As Larsen's et al., (2009) state, there is a need to deal with the "lack of trust
240 between academics and administrators" (p. 14). The growing gap in the relationship between

241 academics and administrators is important to resolve because it has major implications for

242 academic resilience (Del Favero & Bray, 2010; Larsen et al., 2009). Certainly, there needs to

243 be movement towards a relationship which is consensual one that is transparent, accountable,

244 equitable and inclusive, built on trust (Sheng, 2013).

245 A significant source of acute stress for academics in recent times has been that caused by the

246 COVID-19 pandemic. As successive waves of COVID-19 infections spread across the world,

247 lockdowns were enforced, international borders were closed, and academics pivoted to

248 working online almost overnight (Chronicle of Higher Education, 2020). The myriad of

249 challenges created for higher education by the COVID-19 pandemic are likely to continue for

250 several years. Some commentators offer graphic descriptions of the consequences of the

251 COVID-19 pandemic. For example, Watermeyer et al., (2021 a, b) claim the impact of

252 COVID-19 is similar to "well known aspects of academics' recent history" with "professional

253 dysfunction and disturbance, of inequality, exploitation and neglect; of confidence and trust

254 abused and squandered; of disempowerment, displacement and marginalisation; of self-

255 concept on trial and in tatters; of vulnerability and helplessness; and of the loss of a much

256 maligned past superseded by the perceived machinations of digital dystopia and threat of

257 professional oblivion" which has "supercharged a sense of existential panic among academics"

258 (Watermeyer et al., 2021a p. 638). It will be important for future studies to disentangle the

259 actual impacts of universities' responses from the immediate or distal perceptions of academics

260 to the stress of the COVID-19 pandemic experienced in 'the heat of the moment'. We should

261 also be careful about the influence of such dystopian representations on the morale of

262 academia. Given this caution, however, it remains the case that academics' experience of

263 stress and the impacts from the COVID-19 pandemic has been shared internationally and is

264 multidimensional (McGaughey et al., 2021; Shanker et al., 2021; Watermeyer et al., 2021a,

265 b; Table 1).

266

267 Certainly, as in responses to other crises, the COVID-19 pandemic has led to job losses and

268 fewer academic staff. For those remaining staff, there have been concerns including work

269 intensification, but whether this reflects a greater scrutiny of performance and an acceleration

270 of the corporate character of universities is unclear and too soon to determine (Watermeyer et

271 al., 2021b; Table 1). It seems evident that COVID-19 has caused a reprioritisation of teaching

272 over research, which some have commented on has placed teaching in the rightful place of

273 importance it deserves, but nevertheless the closure of campuses and restrictions on laboratory

274 and field work have caused much research and practice teaching to cease, especially in

275 Science, Technology, Engineering, Mathematics and Medical (STEMM) laboratory-based

276 disciplines (Peters et al., 2020; McGaughey et al., 2021; Shanker et al., 2021; Table 1).

277 There are valid concerns about the flow-on effect of research cessation and diversion from

278 research to teaching on academic permanence and the achievement of tenure, promotion, and

279 progression (Shanker et al., 2021). COVID-19 has also led to significant job losses,

280 disturbance to pedagogical and pastoral roles of academics and escalation of work-related

281 stress for the remaining academics (Watermeyer et al., 2021a, b). Academics report stress

282 and waning resilience, fatigue and exhaustion, destabilisation of work-life balance and

283 unequal impacts on women with children and those with caring responsibilities (McGaughey et

284 al., 2021; Shanker et al., 2021, Watermeyer et al., 2021 a, b).

285

2. Responses of Academics to Stress

287 What are the responses of academics to these stressors? In order to understand the responses

288 of academics to these sources of stress, we summarise below what is known about the main

289 impacts of these stressors on academics including any positive adaptive responses to

290 potentially negative stress.

291 Responses by academics to the stress of rejection and criticism as expected can be but, are not

292 always negative. Negative responses to rejections can be counterproductive and lead to

293 reduced effort and the avoidance of research. More positive responses to rejection involve

294 thoughts like "I can learn from this" rather than "I'm useless" and lead to more positive actions,

295 such as decisions to submit the manuscript to another journal or moving onto another project,

296 rather than ruminating (Chan et al., 2020). Rejection and criticism can also create a "battle-

297 hardened academic" better able and more protected against rejection and criticism (Chan et

298 al., 2020). These "battle hardened" and sometimes older and more experienced academics

299 have learnt to emotionally detach themselves from rejection and as a result can use negative

300 feedback they receive in criticism to become more productive. Academics, however, vary in

301 their "rejection sensitivity" (Butler et al., 2007). Rejection sensitive authors, upon receiving a

302 rejection, may engage in higher social monitoring, scrutinizing interactions with others to see if

303 they will be rejected, or by avoiding discussions of rejections in attempts to manage others'

304 impressions of them while cognitively enhancing the value of the journals in which they have

305 published (Pickett et al., 2004). Rejection sensitivity also influences cognition, perception, self-

306 regulation, emotion, motivation, and performance and can result in dysfunctional coping

307 mechanisms (Downey and Feldman, 1996; Frydenberg, 2017; Kaiser & Kaplan, 2006).

308 Rejection sensitivity can be a concern because it is a dynamic construct and with the frequency

309 of rejection in academia, the potential for developing rejection sensitivity is high (Day, 2011).

310 Developing such sensitivity is ultimately counterproductive to building resilience. In the worst-
311 case scenario, responses of academics to rejection may cause them to leave higher education
312 (Day, 2011), although for some rejection can also be used to build resilience.

313 Responses of academics to student evaluations are complex. Most simply, when academics
314 receive poor student evaluations their response can be negative and defensive as they
315 rationalise their poor performance to protect their self-concept as teachers (Arthur, 2009;
316 McKeachie, 1979). Roche & Marsh (2000) emphasise the importance "of teachers' perceptions
317 of their own teaching effectiveness – their teacher self-concepts and the flow on effect of self-
318 concept on motivation, behaviour and value" (p. 440). Studies have found convergence
319 between academic self-concept and student evaluations. That is, academics adjust their
320 perceptions upwards or downwards in response to student evaluations (Marsh & Roche, 1997,
321 1999, 2000; McKeachie, 1979). Marsh & Roche (2000) found that teachers who receive poor
322 ratings, can become anxious and defensive, and may adopt unhelpful "self-serving"
323 rationalisations where they attribute the low rating to external biases, to protect their self-
324 concept. Academics who receive lower than expected ratings by students thus may respond
325 with denial, defensiveness, and overall reject student evaluations as a valid source of
326 information. In such a situation, academics may direct their attention away from improving
327 their teaching practice and towards alternative activities such as research and governance.
328 Even when academics agree with poor student evaluations, they may find themselves helpless
329 to improve (Marsh & Roche, 2000). Roche & Marsh (1993) state "it is not surprising that many
330 university teachers lack confidence about their teaching effectiveness, and may not know how
331 to improve, even if motivated do so" (Marsh & Roche, 1993 p.446). Similar to rejection
332 sensitivity, responses of academics to negative feedback vary. Moore & Kuol (2007) found,
333 while academics respond positively to positive feedback, half of academics respond
334 negatively, and the other half positively, to negative feedback. Those academics whose
335 response was positive to negative feedback acknowledged that they would make a change to
336 something in their class, in order to address the feedback (Moore & Kuol, 2007). Such positive
337 responses to the stress of negative feedback is similar to learning from the rejection of a
338 manuscript or grant. Given that rejection is here to stay and more impactful at the beginning
339 of an academic career, it is especially important that ECAs learn coping mechanisms to
340 normalise rejection and use the feedback in rejection to improve the quality of their work to
341 avoid developing rejection sensitivity (Conn et al., 2015; Day, 2011; Mantai, 2017; Matthews
342 et al., 2014).

343 In contrast, those academics whose response was negative to negative feedback although they
344 may embark on a realistic commitment to improvement, they also risk dismay, rejection, and

345 withdrawal from a commitment to developing teaching effectiveness (Moore & Kuol, 2007).
346 Rather like the battle hardened academic (Chan et al., 2020; Day, 2011), negative responses
347 towards negative feedback can become less frequent with experience (Arthur, 2009). When
348 negative feedback occurs, adaptive processes need to be put in place, so academics are
349 given support to identify issues and solutions – especially given so many academics do not
350 have training in education. If support is provided the worst-case scenario is when academics
351 resort to manipulative strategies by lowering standards or awarding students very high
352 grades in response to negative feedback (Marsh & Roche, 2000). Acceptance rather than
353 rejection of negative feedback in student evaluations can build resilience.

354 Unfortunately, the shortcomings of student evaluations have received more attention than their
355 benefits in recent times (Fan et al., 2019; Frederike et al., 2017; Hamermesh and Parker,
356 2003). Studies have found strong biases against females or culturally diverse non-native
357 English speakers (Fan et al., 2019; Frederike et al., 2017; Kaschak, 1978; Sinclair & Kunda,
358 2000). In some cases, female teachers can receive feedback 37 % lower than their male
359 colleagues (Frederike et al., 2017), especially at the upper end where the biases are
360 strongest against young women (Boring, 2017; Frederike et al., 2017). There is also some
361 evidence that good-looking (Hamermesh & Parker, 2003) or easy marking (Greenwald &
362 Gilmore, 1997; Neath, 1996) academics receive more positive student evaluations. While
363 these biases support arguments that student evaluations should not be used for judging
364 performance, tenure, and promotion, regardless of value (Zabaleta, 2007), they can also
365 prevent academics from accepting the valuable feedback they contain. Overall, the responses
366 of academics to student evaluations matter because they influence the take up of reflective
367 practice, professional development and potential to improve (Arthur, 2009; Moore & Kuol,
368 2007).

369 Responses of academics to the more corporate higher education enterprise has been either to
370 acquiesce or instead to defend their position, practice, and identity (Winter, 2009). Defensive
371 responses of academics have been to unionise and protest about constraints on the academic
372 enterprise and real reductions in academic freedom (Becher & Trowler, 2001; Teichert et al.,
373 2013; Weatherson, 2018). Such defense, however, costs energy and time and erodes
374 resilience; energy which could be more effectively allocated to other activities. As Whitchurch
375 and Gordon (2013), found "the psychological impact of change [in higher education] cannot
376 be underestimated….listening, empathetic skills were seen as vital" (p. 225). To build
377 resilience in academics, executive leadership need to understand the pressures on academics
378 and build relationships of trust (Whitchurch & Gordon, 2013). To continue with an autocratic
379 and authoritarian executive management leadership style - including outsourcing of Enterprise

380 Bargaining Agreements to large multinational professional services firms and 'spill and fill'
381 restructuring processes erodes trust, productivity, and academic resilience.

382 Systematic assessments of research and underperformance of academics in research have led
383 to the establishment of education-focussed roles. Responses of executive leadership to
384 educational focussed roles are positive and are viewed as the single most powerful force to
385 reshape higher education (James et al., 2013; Norton, 2016; Probert, 2013, 2015).
386 Responses of academics to education focussed roles have been mixed (Probert, 2013, 2015;
387 Ross 2019; Whitchurch & Gordon, 2010). While some academics view changes to the
388 academic role as an opportunity to focus on teaching rather than research (Bush et al., 2008;
389 Flecknoe et al., 2017; Probert, 2013), others, especially those academics who because of
390 underperformance in research have been transferred from traditional teaching and research
391 role to education focussed roles, see it as unconscionable (Probert, 2013, 2015; Ross, 2019).
392 Even academics in executive leadership roles express concerns that the removal of research
393 from an academic role will erode research-led teaching (Schmidt, 2019), and changes to
394 academic identities (Henkel, 2002; 2005). There are reasons for concern, given that changes
395 to the academic role will be more likely to impact on women, and entrench their existing
396 underrepresentation in research roles at senior levels in higher education (Bell, 2009; 2010;
397 Diezmann & Grieshaber, 2019; Ross, 2021).
398
399 Positive responses to the COVID-19 pandemic have been far less visible than the negative and
400 stressful acute experiences. Responses of academics to the stress of COVID-19 have been
401 described by Watermeyer et al., (2021a; Table 1) as "afflictions" and "affordances" or
402 negative and positive outcomes as a response to stress and adversity. The positive responses
403 of academics to the COVID-19 pandemic have been the reprioritisation of teaching rather
404 than research and opportunities for novel pedagogical experimentation and ensuing reflective
405 practice (Shanker et al., 2021; Watermeyer et al., 2021a; Table 1). Academics report
406 positive changes from remote working, including increased flexibility and greater social
407 connectivity and inclusivity, which is ironic given this has been the time when academics have
408 been physically furthest apart (McGaughey et al; 2021; Watermeyer et al., 2021a; Table 1).
409 There have been several reports that the COVID-19 pandemic has done more for digital
410 transformation and online learning than at any other time in higher education (Dietrich et al.,
411 2020). Opportunities for change in the curriculum and in teaching approaches by academics
412 are being widely discussed (Bryson & Andres, 2020; Dietrich et al., 2020; Gonzalez et al.,
413 2020; Kay et al., 2020; Kedraka & Kaltsidis, 2020; Lyons et al., 2020; Peters et al., 2020;
414 Rapanta et al., 2020). Increased emphasis on pedagogy and uncertainty about what to

415 leave behind and what to carry forward provide hope for a positive outcome (Peters et al.,
416 2021) during a period of time when academics have experienced great adversity (de los
417 Reyes et al., 2021). Despite the pressures from COVID-19, academics at different stages in
418 their careers and global contexts have demonstrated sustained engagement (Cohrssen et al.,
419 2022). Studies have suggested that institutions need to systematically and sustainably support
420 academics in times of adversity (Mahat et al., 2022) to build resilience to navigate what is a
421 complex and changing higher education ecosystem (de los Reyes et al., 2022).

422

423 Insert Table 1 here

424 So how do we build conditions which create positive responses to stress which optimise the
425 resilience of academics at various levels in the higher education ecosystem? We answer this
426 first by defining resilience, then reviewing what is known about resilience in teacher education
427 and finally by outlining a framework or model to reduce the impact of negative stress on
428 academics by building strategies which create positive responses of academics to stress, which
429 can be particularly useful when higher education faces a crisis such as the COVID-19
430 pandemic.

Resilience of Academics

432 Multiple disciplinary fields over the last half century have explored responses to stress and
433 resilience of complex systems and individuals despite adversity (Carpenter et al., 2001; Folke
434 et al., 2004; Frydenberg, 2017; Gu, 2014; Gunderson, 2000; Karlson et al., 2013; Masten,
435 2001; Walker, 2019). Resilience can be broadly defined as the capacity of an ecosystem,
436 society, individual or academic to "bounce back" and recover from change and stress, whether
437 stress is at a small scale such as a curriculum or faculty restructure or a full-blown crisis such as
438 COVID-19 which has catapulted resilience into the everyday vernacular (Gunderson, 2000;
439 Walker, 2019; 2020). Resilience was first used in engineering to describe systems which
440 resisted stress by not changing (Holling, 1996;1973). Gunderson, (2000) drawing of the
441 earlier work of Holling (1973), defines resilience as the magnitude or time required for a
442 complex system to return to an equilibrium or steady state following stress. stress i.e. duration
443 that the system or individual is pushed away in a negative direction from equilibrium by stress
444 (Figure 1) or the time taken to return to an equilibrium (Gunderson, 2000) i.e. when a complex
445 ecosystem or a component of an ecosystem moves from one state to another, the magnitude or
446 time taken for this change to occur is the resilience (Figure 1).

447

448 Insert Figure 1 here

450   Psychologists have a broader definition of resilience described in terms of the individual

451   rather than the ecosystem (Carver, 1998; Earvolino-Ramirez, 2007; Masten, 2001; Tugade et

452   al., 2004a). Resilience is the emotional response of an individual, to endure or "bounce back"

453   and overcome stress. Resilience is also considered as the capacity to respond to repeated or

454   cumulative stress and maintain emotional equilibrium, rather than a single adverse event

455   (Figure 1 C). Responses to coping with stress include strong social connections and a more

456   positive mindset which are known to increase resilience and ameliorate stress (Frydenberg,

457   2014). Although resilience was originally thought of as an extraordinary attribute, more often

458   it is now thought of as a normal and ordinary response to the frequency of stress which is

459   needed to endure and overcome stress and adversity (Masten, 2001; Schoon, 2006).

460   Resilience is now part of our everyday language as the frequency of global disasters such as

461   the COVID-19 pandemic increase to which ecosystems, society and individuals must respond to

462   and recover. Importantly, multiple fields agree that resilience is not simply, just about

463   "bouncing back" (Walker, 2019; 2020), but about having the "adaptive capacity" to "learn"

464   from adversity and stress. The concept of resilience has been used in the fields of ecology,

465   psychology and more recently school education to conceptualise the capacity of an ecosystem,

466   society, and individuals or teachers to have a positive response to stress and thereby maintain

467   identity; in the case of a teacher being retained in the school ecosystem. In contrast, resilience

468   has rarely been used to conceptualise how academics respond to change and adversity (but

469   see the recent study by de los Reyes et al., 2021; Mahat et al., 2022 and references within).

470   Overall, remarkably, responses of academics to the multiplicity of stressors in a contemporary

471   university are not always negative and provide evidence that there is capacity of academics

472   to "learn from or adapt" to stress and, as a consequence, have the same function and structure

473   and maintain the same identity – i.e. to remain much the same type of system – and persist in

474   the face of setbacks and build resilience. However, resilience has limits. The limits of

475   resilience are "tipping points". Tipping points are reached when the cumulative effect of stress

476   and challenges or large and traumatic events do not build resilience, are counterproductive

477   and tip over a threshold of tolerance to an alternate state (Gladwell, 2002; Hughes et al.,

478   2003). Once a threshold is breached, an ecosystem, organisation or teacher can tip over to

479   an alternate, undesirable state and in the case of a teacher or an academic be lost from the

480   system (Gu, 2014). When an ecosystem, organisation or teacher is close to the limits or

481   threshold of resilience, a small amount of stress can breach the threshold and tip the system or

482   individual over to an alternate state or individual collapse. These alternate states are almost

483   difficult or impossible to reverse. For example, when the COVID-19 pandemic causes the loss

484   of face-to-face lectures to online lectures. An academic may also tip over a threshold of

485   tolerance in a higher education context, from a small amount of stress, which has been

486   cumulative over time, and then leave the system. Paradoxically, being pushed to the limits and

487   adapting to stress at the boundaries of thresholds builds resilience i.e. avoiding stress does not

488   build resilience. Repeated exposure to stress can also build resilience and act as an

489   inoculation against subsequent stress, rather like a vaccination – also known as "stress

490   inoculation" (Parker et al., 2006; Ross et al., 2016). Resilience should not always be thought

491   of as a good state, there are some undesirable ecosystems, which have resilience. There are

492   also times when resilience should not be maintained because a more substantial change is

493   needed. A change in a current system from an old to a new and different system is known as

494   a transformation (Carpenter et al., 2014; Gunderson, 2000; Walker, 2019). Transformations

495   require leaders, who are intentional and move the system away from the status quo and out of

496   a state of denial, towards options, i.e. a transformation requires actors in the system to stop

497   doing the same things which are not working and move the system towards change (Walker,

498   2019; 2020).

499   While academic resilience has received significant attention in terms of a multidimensional

500   construct and a capacity to recover from setbacks and failures in learning (Martin & Marsh,

501   2006; Martin & Marsh, 2008), the resilience of academics to the stresses of everyday

502   academic life (Chan et al., 2020; Lee et al., 2021) and to the more significant pressure of a

503   pandemic has received less attention (de los Reyes et al., 2021; Mahat et al., 2022). Only

504   recently have studies defined the resilience of academics as "the dynamic process and

505   interaction between an academic and their ever-changing environment that uses available

506   internal and external resources to produce positive outcomes in response to different

507   contextual, environmental, and developmental challenges" (de los Reyes et al., 2021p. 13).

508   This definition emphasises the relational rather than the individual as similarly emphasised in

509   teacher education (Gu & Day, 2007; Gu & Day, 2013), and positive outcomes, but does not

510   explicitly refer to the key aspect of resilience, which is the capacity to learn from and adapt

511   to stress.

512   Answers on how to build resilience in academics may be informed by a better understanding

513   of resilience among school teachers which has emerged over the last decade in response to the

514   increasing demands on the teaching profession (Ainsworth & Oldfield, 2019; Day & Gu,

515   2010; Gu & Day, 2007). Research on resilience among teachers has focused on the

516   importance of teacher retention and teacher resilience for student performance and the

517   conditions needed to build both student and teacher resilience (Gu & Day, 2007; 2013). As in

518   other fields, resilience of school teachers is defined as their capacity to bounce back when

519 faced with adversity or stress (Day & Gu, 2010; Gu & Day, 2007; 2013). At first, the basis

520 of teacher resilience was thought to be dependent on individual personality traits such as self-

521 efficacy and self-esteem. Personality differences were used to explain the variation in

522 responses of teachers to adversity and the subsequent reasons for teacher retention or loss

523 (Bonanno, 2004; Luthar & Brown, 2007). Later, the relational aspect of teacher resilience was

524 recognised. Teacher resilience was then viewed as dependent on the level of trust and

525 support among colleagues and principals in the social and organisational structure of the

526 school. Such a relational view of resilience, rather than as an individual personality trait, puts

527 more responsibility on school governance to create a supportive environment (Beltman et al.,

528 2011; Day, 2013; Day & Gu, 2007; Gu, 2014; Gu & Day, 2007; Luthar & Brown, 2007;

529 Mansfield et al., 2016; Ungar et al., 2012; 2013). Ungar (2012) emphasised the difficulty in

530 reconciling the relational aspects of teacher resilience independent of individual personality

531 traits such as self-efficacy and self-esteem which also depend on good relationships (Ungar

532 2012). It is now thought that teacher resilience and the capacity of teachers to "bounce back"

533 from adversity is an interaction between individual personality resources such as self-efficacy

534 and self-esteem and the professional internal and external relational social and

535 organisational environments (Beltman et al., 2015; Gu, 2014; Ungar, 2012). When these

536 interactions are positive, they build resilience and form the basis of teacher wellbeing and job

537 satisfaction and student performance; when they are less than positive, they erode resilience

538 and lead to teacher burnout and loss from the profession (Beltman et al., 2011). Ungar et

539 al.'s (2013) model can be applied to an understanding of academic resilience because

540 academics have the capacity to draw on resources available to them to build resilience,

541 including interrelationships and support from colleagues and the executive leadership but, at

542 the same time, these colleagues are their direct competitors. Academics within higher

543 education are individualistic and in increasingly competitive environments, where achieving

544 individualistic goals aids institutional performance. In contrast to teachers in schools,

545 academics in higher education are judged on their performance primarily in research and

546 grant winning rather than education and teaching quality. Academics in contrast to teachers

547 have and allegiances to cultures of disciplines rather than institutions (Becher & Trowler, 2001).

548 Understanding resilience of academics may also come from better understanding of resilience

549 of the entire higher education ecosystem. Executive leaders can limit the stress on academics

550 by building resilience of the higher education ecosystem through effective functioning and

551 governance (Karlsen, 2013 p. 18). Resilience of institutions has been defined as the intrinsic

552 ability of an institution to adjust its functions prior to, during and following unexpected change

553 or stress (Karlsen, 2013) and developing a highly tuned sense of future developments

554 (Valikangas & Romme, 2012; Wildavsky, 1991). Valikangas & Romme (2012) describe three
555 strategic management practices for institutions to build resilience. These are cultivating
556 foresight, rehearsing non-routine behaviours and building an experiment-orientated
557 community. They also suggest that resilience of organisations has two dimensions: operational
558 resilience, being the ability to bounce back after a crisis, and strategic resilience, which is the
559 ability to turn a crisis into an opportunity (Valikangas & Romme, 2012). Since the mid-1980s,
560 and long before the COVID-19 pandemic, attempts to create more adaptive governance
561 structures has been a priority of higher education (Larsen et al., 2009; Whitchurch & Gordon,
562 2013). Building resilience in higher education requires the resolution of conflicts and dilemmas
563 between executive leadership, administrators and academics to build trust through adaptive
564 management practices which cultivate foresight and experimentation both at an operational
565 and strategic level, so when a crisis occurs, such as the COVID-19 pandemic, it can be
566 weathered. Such resolutions are needed for arguments over parallel academic and
567 administration decision making structures, the mix and influence of representation of internal
568 and external stakeholders including domestic and international students, the balance between
569 centralisation and decentralisation and the redistribution of authority within institutions (Larsen
570 et al., 2009).

571 ## A Framework to Build Resilience of Academics

572 The resilience of academics can be considered in the framework of Bronfenbrenner's (1977)
573 socio- ecological model of development (Ungar, 2012; Ungar et al., 2013). Bronfenbrenner
574 (1977) conceived of a child's environment like a series of nested babushka dolls and defined
575 human development "as the person's evolving conception of the ecological environment, and
576 his [sic] relation to it, as well as the person's growing capacity to discover, sustain, or alter its
577 properties" (p. 9). Bronfenbrenner's (1977) model positions the child in a set of nested
578 relationships in their environment; where the individual is influenced by the environment and, in
579 turn, the environment influences the individual (Bronfenbrenner & Ceci, 1994; Ungar, 2012;
580 Ungar et al., 2013), shown as a series of concentric circles (Figure 2). At the centre of the
581 circle is the child or individual, and the circles that then span out from the individual are the
582 microsystem, the mesosystem, the exosystem, the macrosystem, and the chronosystem
583 (Bronfenbrenner, 1977; Bronfenbrenner & Ceci, 1994; Guy-Evans, 2020). The first circle is the
584 microsystem, where the interactions between the individual and the environment are bi-
585 directional; each influence and can change the opinion of the other. The mesosystem is the
586 interactions among microsystems. The exosystem is the environment which does not directly
587 contain the individual but has significant influence. The macrosystem is the influential culture in
588 which an individual is immersed, and which influences belief. Lastly the chronosystem is the

589   place of events which influence individuals and occur over a lifetime (Guy-Evans, 2020; Figure

590   2). Ungar et al., (2013) used Bronfenbrenner's model to conceptualise an ecological model of

591   resilience and can also be applied to academics in the higher education ecosystem. An

592   academic is in the microsystem with direct influence from peers, colleagues, students and

593   supervisors. The exosystem is the environment which does not directly contain the individual,

594   but has significant influence, e.g. decisions made by deans and vice chancellors. The

595   macrosystem is the influential culture in which an academic is immersed, which influences

596   beliefs, i.e. the culture of higher education. Ungar et al., (2013) state, "this way of

597   conceptualising resilience means that individuals are not always the most important locus for

598   change" (p. 357). Resilience in academics, similar to resilience in school teachers' experiences

599   of stress is not all explained by the individual characteristics of an academic but, rather, is a

600   product of the multiple systems in which the academic interacts and is influenced by the

601   relationships in the exosystem and mesosystem (Beltman et al., 2015; Mansfield et al., 2016;

602   Ungar et al., 2013). As Ungar et al. (2013) state, "our understanding of resilience is shifting in

603   much the same way that Bronfenbrenner shifted the focus on human development from the

604   individual to the multiple systems with which the individual interacts" (p. 349).

605   Insert Figure 2 here

606   The resilience of an academic is thought to be greatest when there is a moderate period of

607   time between stress-inducing events. In other words, too much stress can be overwhelming and

608   not enough stress can cause complacency. Resilience may also be reduced when there are

609   long gaps or short gaps of time between episodes of stress i.e. long intervals of no stress and

610   short intervals between stressful events are likely to be equally damaging when a future

611   stress-inducing event occurs (Hughes et al., 2021). Resilience is also not the same as resistance.

612   An academic, particularly a battle-hardened academic, may appear resistant to the stress of

613   grant rejection, but the memory of this experience remains and may affect their propensity to

614   re-apply and a future response to rejection. Bronfenbrenner's socio-ecological model of

615   resilience moves an understanding of resilience away from the individual, in this case the

616   academic, towards a focus on the socio-ecological factors that impact on academics in the

617   higher education ecosystem which can facilitate well-being under stress (Ungar et al., 2013).

618   Insert Figure 3 here

619

620   **Solutions and Conclusion**

621   Finally, multiple authors have offered solutions to the challenges of building resilience.

622   Solutions such as mentoring, establishing supportive networks of colleagues and creating

623 institutional cultures which are not hostile and are instead collegial. These solutions provide

624 support, soften the impact of rejection and criticism (Chan, 2020; Conn et al., 2016; Day,

625 2011; Hollywood, 2020; Mahat et al., 2022), facilitate adaptive capacity and build success

626 and resilience and have become important because of COVID-19 (Mahat et al., 2022). These

627 solutions can be considered as effective in limiting the magnitude of the impact of the stress

628 and decreasing the timing of recovery (Figure 3). For example, consider two career

629 trajectories of an academic, A and B with stress and recovery periods caused by rejection,

630 competition and end of contract or loss of tenure (Figure 3). Academic Individual A

631 experiences less significant impact to the same stressors than individual B and less energy is

632 expended to recover and survive to reach a new equilibrium, whereas academic B suffers

633 significant impact and is lost from higher education. Here academic A has experienced more

634 positive bidirectional relationships in the microsystem and exosystem, while academic B has

635 not. Academic A survives and may go on to reach a new equilibrium such as a promotion,

636 while academic B needs to find a new career. Transformation applies to both academic A and

637 B: academic A may have transformed and created a new identity as a teacher, whereas

638 academic B may have found themselves unable to connect with social networks and mentoring

639 or be open to new ideas being led by the leaders in the macrosystem. In this way, the

640 relationships described by Bronfenbrenner's model are activated at each stress event and can

641 increase the effectiveness of the recovery (Figure 3A).

642

643 In answering the key questions in this review, we argue that understanding and building the

644 resilience can strengthen the retention of all academics especially those who are most

645 vulnerable such as ECAs and education focussed academics in higher education in what is

646 clearly a changing and uncertain landscape (de los Reyes et al., 2022). Such resilience will

647 likely have flow on effects to students' performance and education quality (Gu, 2014) and the

648 building of trust in the wider democratic practices in higher education ecosystems.

649 Conceptualising academic resilience as relational as described by Bronfenbrenner, places an

650 onus on executive leadership to deliver and build a culture which is more trusting and less

651 harsh than that which currently exists. The problem with the widening gap in values between

652 academics and executive leadership is that the relationships in the socio-ecological model of

653 Bronfenbrenner can become frayed and cascade to have negative impacts on students. Given

654 the future adverse operating environment for higher education, the changing nature of the

655 academic role, the on-going structural reform and the uncertainty of the COVID-19 pandemic,

656 understanding how academics and higher education ecosystems learn and adapt to stress to

657 build and sustain resilience has never been more important.

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