Title

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Changes in grit and psychological capital at the time of major crisis: nursing students' perseverance, resources, and resilience

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Abstract

Objectives: To examine changes in grit and psychological capital among nursing students prior to, during the height of the pandemic, and more than 12 months after the initial pandemic announcement.
Methods: A cross-sectional study design addressed the aim of the study. Nursing students undertaking a three-year baccalaureate degree between 2019 and 2021 were included.
Results: Mean grit levels among the n=818 unique student participants were significantly lower in 2020 than in 2019 and 2021; however, no significant difference was detected for psychological capital over the same period.
Conclusions: Although normative day-to-day challenges may aid grit development, a major event has a negative impact yet has a buffering effect of negative life events at the time of a crisis. The study further placates that psychological capital remains malleable and open to change at the time of a crisis and may be an essential mechanism to mediate grit and has the capacity to influence student performance over time. It remains essential to develop grit through the mediating elements of psychological capital to enable nursing student to undertake academic studies, particularly in the event of major challenges, such approaches may further enable students' endurance to withstand major crises as they enter the workforce.

Keywords: CRISIS; grit; nursing student; psychological capital; student.

Introduction

The coronavirus disease (COVID-19), which is caused by the novel coronavirus (SARS-CoV-2) had been reported in late 2019, and the World Health Organisation declared it a global pandemic on 11th February 2020. This led to the closure of international borders and numerous other precautionary measures in an attempt to mitigate the global spread of the virus (Rammstedt et al., 2021; Srivastava & Saxena, 2020). The uncertainty of this virus, its transmission, diagnosis, and treatment eluded scientists for nearly a year (Lurie et al., 2020).

Within Australia, a national public health emergency was declared on the 16th of March 2022 with several precautionary strategies enacted with state-based mandates further enacted from March to June in most jurisdictions (Storen & Corrigan, 2020). These mandates differed between states and included, but were not limited to, working and studying from home, the inability to leave home except for seeking essential services such as food shopping, medical care, to provide care, or an hour of exercise each day. At all times when leaving home, the use of masks, hand sanitising, and social distancing was to be maintained. In addition, in some states, individuals could not travel more than 5 km s (3.1 mi) from their homes as part of these restrictions unless they were essential workers (Storen & Corrigan, 2020).

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During this time of international, national, and personal crisis, nursing programs and their students were forced to rapidly transition to a new way of learning, yet still meet the same end of program expectations. Students were grappling with emotions such as fear, anxiety, disappointment, and anger (Beisland et al., 2021; Lovrić et al., 2020). This shift in education delivery, along with a myriad of setbacks or disappointments in the puruit of becoming a nurse created by the pandemic, provided students with the opportunity to reflect and remember why they embarked on their professional journey and develop ways to achieve their ambition.

Within this context, grit is the consistency of interest (passion) along with the perseverance of effort (perseverance) to achieve long-term goals irrespective of adversity or challenge, where grit remains more predictive of achievement amid challenges than talent alone (Duckworth & Quinn, 2009). Grit is the determination to meet challenging goals in both short, but more specifically, longer periods of time, and is the ability to persistently forge ahead irrespective of the challenge or difficulties that may be encountered (Duckworth et al., 2007; Duckworth & Quinn, 2009). In this sense, grittier individuals have a propensity, when encountering setbacks, poor feedback, disappointments, or plateaus in their pursuits, to continually move forward to improve – they have the capacity not to deviate from their goals (Duckworth et al., 2007; Duckworth & Quinn, 2009).

Grittier individuals have demonstrated to have higher levels of success in academic and non-academic performance; they possess higher levels of motivation as they seek meaning to achieve their goals (Terry & Peck, 2020a). Grit is more than being stubbornly determined to achieve an outcome no matter the cost, but is focussed on achieving longer-term, higher-level pursuits, while at the same time being flexible and less fixated on lower-level day-to-day goals (Duckworth et al., 2007; Duckworth & Quinn, 2009). Duckworth et al. (2007) first introduced the idea of the non-cognitive trait of grit and demonstrated that it correlates with other stable trait-like constructs such as perseverance, consistency, and the Big Five Personality trait of conscientiousness, which are less open to change (Credé et al., 2017; Duckworth et al., 2011; Luthans et al., 2014). Nevertheless, in previous studies, students with high levels of conscientiousness sought outcomes that are achievable, were found to be more careful in decision-making, and were less impulsive (Terry et al., 2019).

The development of grit has been suggested to be achieved through several factors, including challenges or barriers that may stimulate its development. However, it is postulated that individuals do not necessarily require the experience of trauma, tragedy, disadvantage, or discrimination for grit to be more fully enacted or developed. As such, encountering 'appropriate' levels of challenges or difficulties, with adequate and consistent support, allows individuals to grow and develop grit that enables the capacity to 'bounce back' (Duckworth, 2016; Luthans et al., 2006; Terry & Peck, 2020b). Given it is known that excessive challenges may be detrimental to or counterproductive to the development of grit and that grit scores have been shown to be relatively stable over time (Duckworth & Quinn, 2009), our understanding regarding what impact major challenges or crises have on levels of grit and the traits that facilitate grit remains somewhat elusive.

Beyond grit and its development, psychological capital (PsyCap) is also made up of less stable state-like constructs that relate to the potential capacity of individuals to attempt and be successful at challenging tasks. The four constructs of PsyCap, encompass hope, efficacy, resiliency, and optimism (HERO) remain malleable and share the common theme of "positive appraisal of circumstances and probability for success based on motivated effort and perseverance" (Luthans et al., 2007, p. 550). Hope is the ability for an individual to set a goal, create pathways in the face of barriers to achieve the goal, and build agency (Snyder & Rand, 2003). Efficacy is a perception or belief regarding one's personal abilities, while resiliency relates to adaptation and the ability to bounce back when barriers occur in a pathway. Lastly, optimism is the positive outlook that affirms the ability to successfully achieve a goal (Luthans et al., 2014, 2019).

The higher-order state of PsyCap, while being more malleable and open to change or improvement through training and personal development, through learning, setting goals, and asset-building, has been indicated to be the mechanism that mediates grit and influences overall academic performance (Luthans et al., 2014, 2019; Schimschal et al., 2021). Specifically, PsyCap mediates the effect of grit in terms of academic performance by influencing individual hope, efficacy, resilience, and optimism among students (Luthans et al., 2019; Schimschal et al., 2021). In this sense, psychological resources are more proximal to academic success, while the non-cognitive trait of grit remains relatively distal to academic performance, where PsyCap drives students beyond their

consistency of interest and perseverance of effort to achieve their long-term goals (Luthans et al., 2019; Schimschal et al., 2021).

As such, within the context of lower levels of challenge or difficulty supporting the development of grit and PsyCap, which is more open to change, the aim of this research was to investigate what impact a major crisis, such as a global pandemic, may have on levels of grit and psychological capital among higher education nursing students.

Hypotheses

Our study aimed to explore what impact external challenging events may have on grit and psychological capital scores among nursing students and how levels may respond over time.

As such, we hypothesised that:

(1) Grit as a stable trait-like construct would decrease at the beginning of a major crisis and return to pre-crisis levels over time (H1);
(2) Psychological capital, as a malleable state-like construct, would remain relatively unchanged over time regardless of a major crisis occurring (H2); and
(3) The association between grit and psychological capital will remain relatively similar over time regardless of a major crisis occurring (H3).

Methods

The study aimed to examine changes in grit and psychological capital among nursing students prior to, during the height of the pandemic, and more than 12 months after the initial pandemic announcement. A repeated cross-sectional design were used to collect data from nursing students. Student data were specifically collected over a three-year period at an Australian university were examined.

Sample

All nursing students studying a three-year Bachelor of Nursing degree over the three-year period, from 2019 to 2021, were invited were invited to complete an online questionnaire using Qualtrics software (Qualtrics©, Version May 2021). The repeated cross-sectional design enabled the whole student population to be invited annually to participate each year. In this case most students may have been asked to participate in the study more than once over the three-year period. For example, second- or third-year students in 2020, 2021 may have been invited to participate more than once over the three-year period, however the authors did not specifically follow a continuing sample of students over time. The repeated cross-sectional design and recruitment methods demonstrates a higher number of participation requests over this time-period than actual students studying the degree (n=3,933) (Table 1). Overall, the sample size required (n=363) was calculated to have power to detect a 5 % absolute difference within and between groups, alpha (2 tailed)=0.05, margin of error=±5 %.

Data collection

Data were collected mid-year 2019, 2020, and 2021 in the mid-year study break (May-June) of each study year, and included follow-up reminders in weeks 1, 2, and 4 post initial invitation. It must be noted the 2020 data collection occurred twelve weeks after the initial

Table 1: Total enrolments over three-year period.

Student enrolments	2019	2020	2021
1st year enrolments	921	978	570
2nd year enrolments	931	953	819
3rd year enrolments	501	416	683
Total enrolments (actual)	2,353	2,347	2072

public health emergency was declared nationally. Data were collected using an online questionnaire and were designed to be completed between 15 and 25 min. The questionnaire included several standardised demographic questions such as gender, year of birth, marital status, year of study, and current employment, as described elsewhere (Terry & Peck, 2020b; Terry et al., 2019). Another scale we used was the eight-item Short Grit Scale (Grit-S) developed to measure trait-level perseverance and passion (Duckworth et al., 2007). Although most research examines the total grit score, this study examined grit along with its two distinct constructs of consistency of interest (passion) along with the perseverance of effort (perseverance), as the original grit scale was developed (Ghanizadeh, 2021). Finally, we also used the Psychological Capital Questionnaire (PCQ-12), which uses 12 items to measure four attributes that include efficacy, hope, optimism, and resilience (Luthans et al., 2004, 2007). All questionnaire items had demonstrated to have good face and content validity, along with acceptable reliability (Cronbach Alpha), Grit-S=0.755 and PCQ-12 coefficients Efficacy=0.836, Hope=0.863, Resilience=0.649, and Optimism=0.82 (Duckworth & Quinn, 2009; Luthans et al., 2007; Terry & Peck, 2020a).

Data analysis

To test the hypotheses, data were analysed using Statistical Package for the Social Sciences (SPSS, Version 25.0) with independent sample t-tests and one-way ANOVAs being undertaken. Correlation strength was defined as large (r=0.50–1.0), medium (r=0.30–0.49), and small (r=0.10–0.29). Significance was determined at two-tailed $p \leq 0.05$, however, the p-value was adjusted using Bonferroni correction to account for the possibility of a Type I error rate resulting from multiple comparisons (Pallant, 2013).

Ethical considerations

Ethical approval was granted by Federation University Australia Human Research Ethics Committee (Approval #18-017).

Results

Among the nursing students invited to participate, n=818 (20.8 %) unique responses were completed among first-, second-, and third-year students and well above the sample size required (n=363). Across the various year levels, student demographics were similar; however, a greater proportion of first-year students (47.7 %) and international students (43.3 %) participated in the 2020 survey than observed in 2019 and 2021. In addition, a greater proportion of students who were married or partnered (59.4 %) and working full-time (16.7 %) participated in 2021 compared to students from previous years (Table 2).

Changes in grit between each study year

When examining levels of grit over the three-year period, a significant difference was noted, where the mean level of grit was significantly lower in 2020 (3.28) when compared to 2019 (3.81) and 2021 (3.76). While no differences in grit measures were evident between 2019 and 2021. Similarly, levels of consistency of interest and perseverance of effort were significantly lower in 2020 compared to other years (Table 3). Further, when examining grit among first-, second- and third-year students over the three-year period, the same significant difference were noted, where the mean Grit levels were significantly lower in 2020 than 2019 and 2021 for first-year ($F(2, 313)=30.791$, $p=0.000$), second-year ($F(2, 311)= 49.864$, $p=0.000$) and third-year students ($F(2, 185)=13.483$, $p=0.000$). Similar findings were found for Consistency of interest and Perseverance of effort.

Changes in psychological capital between each study year

When examining psychological capital over the three-year period, no significant differences were detected between years. However, examining the elements of psychological capital which encompass efficacy, hope, resilience, and optimism, it was noted that only resilience was significantly higher in 2019 than in 2020, while no other differences were detected between 2021 and each year.

Table 2: Participant demographics.

Demographic information	Frequency						
	2019		2020		2021		Total
	n	(%)	n	(%)	n	(%)	n
Year of program (n=818)							
– First year	118	34.9 %	143	47.7 %	55	30.6 %	316
– Second year	131	38.8 %	109	36.3 %	74	41.1 %	314
– Third year	89	26.3 %	48	16.0 %	51	28.3 %	188
Gender (n=818)							
– Male	25	7.4 %	33	11.0 %	18	10.0 %	76
– Female	250	74.0 %	265	88.3 %	162	90.0 %	677
– Other	2	0.6 %	0	0.0 %	0	0.0 %	2
– Missing	61	18.0 %	2	0.7 %	0	0.0 %	63
Age (years) (n=818)							
– Under 30	140	41.4 %	139	46.3 %	89	49.4 %	368
– 30–39 years	87	25.7 %	95	31.7 %	55	30.6 %	237
– 40 years and over	74	21.9 %	66	22.0 %	36	20.0 %	176
– Missing	37	10.9 %	0	0.0 %	0	0.0 %	37
Born in Australia (n=818)							
– Yes	198	58.6 %	170	56.7 %	115	63.9 %	483
– No	79	23.4 %	130	43.3 %	65	36.1 %	274
– Missing	61	18.0 %	0	0.0 %	0	0.0 %	61
Marital status (n=818)							
– Single	93	27.5 %	114	38.0 %	56	31.1 %	263
– Married/partnered	155	45.9 %	157	52.3 %	107	59.4 %	419
– Divorced/separated	15	4.4 %	18	6.0 %	10	5.6 %	43
– Other	0	0.0 %	11	3.7 %	7	3.9 %	18
– Missing	75	22.2 %	0	0.0 %	0	0.0 %	75
Employment status (n=818)							
– Not in paid labour force	38	11.2 %	35	11.7 %	11	6.1 %	84
– Casual employee	106	31.4 %	70	23.3 %	55	30.6 %	231
– Part-time (>38 h week)	130	38.5 %	138	46.0 %	75	41.7 %	343
– Full-time (38 h a week)	43	12.7 %	30	10.0 %	30	16.7 %	103
– Missing	21	6.2 %	27	9.0 %	9	5.0 %	57

Table 3: Comparison of mean grit, consistency of interest, and perseverance of effort scores between year.

Factor	Year 1	Mean score	Year 2	Mean score	Test (df) statistic	p-Value
Grit	2019	3.81	2020	3.28	F(2, 815) = 94.001	0.000[a]
	2020	3.28	2021	3.76		0.000[a]
	2021	3.76	2019	3.81		0.575
Consistency of interest	2019	3.66	2020	2.91	F(2, 815) = 124.095	0.000[a]
	2020	2.91	2021	3.60		0.000[a]
	2021	3.60	2019	3.66		0.547
Perseverance of effort	2019	3.96	2020	3.64	F(2, 815) = 26.011	0.000[a]
	2020	3.64	2021	3.92		0.000[a]
	2021	3.92	2019	3.96		0.797

[a]$p \leq 0.001$.

Table 4: Comparison of mean psychological capital scores between years.

Factor	Year/Year level	Mean score	Year/Year level	Mean score	Test (df) statistic	p-Value
Psychological capital	2019	18.93	2020	18.65	F(2, 763) = 0.694	0.502
	2020	18.65	2021	18.70		0.984
	2021	18.70	2019	19.93		0.704
Resilience	2019	4.82	2020	4.62	F(2, 766) = 3.836	0.019[a]
	2020	4.62	2021	4.68		0.779
	2021	4.68	2019	4.82		0.219

[a]p<0.05.

Table 5: Correlation between grit and psychological capital.

		Grit 2019	Grit 2020	Grit 2021
Psychological capital	r	0.404[b] (0.000)	0.199[b] (0.001)	0.499[b] (0.000)
	Sig.			
Efficacy	r	0.306[b] (0.000)	0.119[b] (0.001)	0.538[b] (0.000)
	Sig.			
Hope	r	0.366[b] (0.000)	0.182[a] (0.042)	0.363[b] (0.000)
	Sig.			
Resilience	r	0.275[b] (0.000)	0.139[a] (0.002)	0.235[a] (0.002)
	Sig.			
Optimism	r	0.378[b] (0.000)	0.200[a] (0.018)	0.388[b] (0.000)
	Sig.			

[a]p<0.05, [b]p<0.01.

Association between grit and psychological capital between each year

When specifically examining the association that exists between grit and psychological capital and each year, it was identified that grit, psychological capital, efficacy, hope, resilience, and optimism had a significant association in each of the years (Table 4). However, when examining differences between each year, it is noted that the associations in 2020 were weaker and less significant than compared to 2019 and 2021. In addition, stronger associations occurred between grit and psychological capital in 2021 than compared to 2019 (Table 5).

Discussion

Overall, the repeated cross-sectional findings indicate that within months of the pandemic occurring, when many citizens of Australia were locked down and isolated as a protective public health measure, the levels of consistency of interest, perseverance of effort, and overall grit among students decreased. In line with hypothesis one (H1), these grit measures, the following year, had increased and although not at the same level as pre-pandemic levels, the measures were not significantly different than pre-pandemic levels.

In their seminal work, Duckworth et al. (2007) and Duckworth and Quinn (2009) suggested that grit is a persistence to overcome challenges and a consistency of interest to achieve meaningful goals. They have also indicated that grit is modifiable, malleable, and increases throughout life, while grit scores are relatively stable over time (Harris & Murray, 2017; Jaavall, 2021). Further, in their critical research, Marie et al. (2019) indicated that grit, particularly higher levels of grit, has the capacity to buffer negative life events and outcomes such as suicidal ideation, crises, trauma, and post-traumatic stress disorder (Blalock et al., 2015).

Nevertheless, our findings indicate that grit scores did decrease significantly within months of a global pandemic, with the largest decrease in scores being the consistency of interest. Thus, the ability to bounce back

from a setback and the consistency of interest to achieve was somewhat diminished compared to pre-pandemic levels. In this sense, the 'shock' of the crisis had waned persistence, which may have seen students question their capacity to endure while also impeding their consistency of interest or their motivation to continue in their studies (Harris & Murray, 2017). The challenge is when higher levels of grit exist among students, this enables the capacity to buffer such events when grit diminishes for a time. However, students who may have a lower level of grit may, therefore, not have the reserved capacity to 'weather the storm' of an acute crisis, leaving little capacity to buffer the crisis or prioritising long-term goals above others. This may lead to an inability to continue with the long-term goal that may have become or was then considered less important at the time of the crisis (Datu et al., 2017). This further highlights that the non-cognitive trait of grit is less open to change, and therefore when a major crisis does occur, this has an impact on overall grit levels (Luthans et al., 2014, 2019).

Further, we posit that when crises occur, such as a global pandemic, natural disaster, or traumatic event, this creates a level of uncertainty, despair, and fear among the individuals, rendering grit, although present, to decrease at the time of the crisis. Grit then stabilises to a point of equilibrium after the initial shock or uncertainly of the event has subsided. In this sense, grit may remain relatively stable over time and may, through a positive feedback loop, enable this non-cognitive trait to remain in a homeostatic state long-term despite an acute or lasting crisis. This is further evident given the pandemic crisis had not ceased or not dissipated in 2021; but individuals had time to process, become accustomed or acclimated to, and built the capacity to develop, manage or cope with the crisis longer-term.

Tedeschi and Calhoun (2004), suggest that it is this struggle with a new reality, that occurs in the wake of a crisis or trauma, fundamentally challenges our safety, identity, future, and reality of the controllable world, and leads to posttraumatic growth to psychological survival. Although posttraumatic growth was not examined among students within the study, it highlights the process many students, as shown elsewhere, have undergone over this period of global crisis (Bono et al., 2020). Further, posttraumatic growth, given its association with perseverance of effort (Silverstein et al., 2018), may provide insight into the personal strength and new possibilities that many students may have experienced; and this growth may have enabled grit to return to similar pre-pandemic levels. However, further research is required to understand the mechanisms of crisis on grit and how grit, although impacted by a crisis, can also buffer against the detrimental impact of a crisis.

In addition to grit, PsyCap scores did not significantly change over the three-year period, regardless of the crisis that was occurring, as indicated in the hypothesis two (H2). This further suggests grit can be impacted by global and or major personal crisis and does bounce back over time. In contrast, psychological capital does, in most cases, remain relatively steady regardless of what is occurring. Specifically, the levels of efficacy, hope, and optimism did not significantly change from pre-pandemic levels, throughout the height of the pandemic or the following year. However, it must be noted that resilience scores within PsyCap decreased significantly within months of a global pandemic and although did not return to pre-pandemic levels, the difference was not significantly dissimilar to the pre-pandemic levels. In this sense, the capacity to bounce back again was somewhat diminished at the time of the crisis, as was observed among grit scores.

These findings confirm the less stable state-like constructs within PsyCap that encompass hope, efficacy, resiliency, and optimism remain malleable and open to change even in the event of a major crisis (Luthans et al., 2019; Schimschal et al., 2021). Thus, it is demonstrated that regardless of the major crisis, or event that has occurred, students continue to have confidence, or the efficacy, to take on and put effort into achieving their goals now and into the future. It is through optimism and hope that students can persevere towards achieving their goals; however, these goals may need to be re-directed or re-imagined to ensure they are achieved (Luthans et al., 2006).

In some cases, these findings contrast with the findings among grit scores, albeit the association between grit and psychological capital remains in place throughout the study period, despite these relationships waning at the height of the pandemic, as outlined in hypothesis three (H3). This further highlights psychological capital remains a mechanism that mediates grit and therefore has the capacity to influence overall academic performance (Luthans et al., 2014, 2019; Schimschal et al., 2021). Of interest, efficacy demonstrates a higher association with grit, which stands to reason given efficacy is the self-belief and motivation that one can undertake and achieve difficult tasks, cope with challenges, or produce anticipated outcomes (Bandura & Locke, 2003; DeWitz et al., 2009; Schyns, 2004). In this sense, this construct is enacted, as outlined by Bandura (1982), as a mediator of action and behaviour

where an individual's beliefs concerning their capacity to produce an outcome influence the achievement of goals and future outcomes (Bandura, 1994, p. 71). Despite these confirmatory findings within the study regarding the impact of a major crisis, the findings warrant further investigation regarding the nuanced relationship between grit and psychological capital and how and what key psychological traits may have a bearing on key elements of grit at the height of a major crisis.

Limitations

The study was a repeat cross-sectional, thus it should be noted that not all the same students participated over time, therefore the findings should be considered carefully. In addition, students with lower levels of grit may have dropped out at the time of the global pandemic, which may also be reflective of the lower enrolment numbers that occurred the year following the height of the pandemic. It must be noted that the university where the study was conducted has campuses in rural, regional, and peri-urban locations with a higher student cohort from rural settings. This may have some bearing on the data, thus making it difficult to generalise the findings to other more urban centres. Lastly, participants may not be representative of the whole student cohort given the low response rate, with only 20.8 % (n=818) of the total student cohort over the time completing the questionnaire. The low response rate may be due to its administration occurring in the mid-year break, when students may not check student emails, have competing demands at this time with work or childcare responsibilities associated with school breaks, and or pandemic associated home-schooling commitments.

Conclusion

Within this study, student grit and psychological capital levels were examined prior to, at the height of, and after the global COVID-19. Within the literature, this is one of the earliest known studies to examine the impact of a major crisis on grit levels. As such, it has demonstrated that although normative day-to-day challenges, crises, or opposition can help aid in the development of consistency of interest and perseverance of effort, a major crisis may have a negative impact on grit levels. However, the study further supports the notion that grit also has a buffering effect on the detrimental impact at the time of a crisis or when negative life events may occur. The study further placates the notion that psychological capital remains malleable and open to change at the time of crisis. Ultimately, the results further highlight that psychological capital remains a mechanism that mediates grit and therefore has the capacity to influence student performance over time. However, there is a need to further investigate the specific relationship between grit and psychological capital in terms of how and what key psychological traits may have the greatest impact or bearing on grit at the height of a major crisis. Such investigations will further support the development of grit among nursing students while enabling their endurance to withstand any crisis, either global, national, local, or personal as they enter the profession. This is particularly vital in the face of increased large-scale disasters caused through climate change, future pandemics, and large-scale health events. It is these events that call for the provision of healthcare support among nurses, which may lead to brain drain, burn-out, high stress, and health professionals questioning if they should stay or leave the profession. Developing grit through psychological capital may be helpful during a student's academic studies, however, may further support them when times are tough when providing care in the workplace.

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