

# Psychological Adaptation after the COVID-19 Pandemic through the Lens of Evolutionary Biology

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## ABSTRACT

Despite its explainability in biological sciences, evolutionary biology has been used to explicate social phenomena through the disciplines of economics and social sciences. This study further extends the usefulness of the theory to understand psychological adaptation of human traits and preferences after the COVID-19 pandemic. It is believed that almost all aspects of life are disrupted by this mechanism of “natural selection”, and thus those who are adaptive to sudden changes are more likely to “survive” regardless of their field of expertise; whereas those who remain static are prone to become “extinct”. Based on the existing literature, three psychological characteristics are considered as adaptive traits: *grit*, *resilience*, and *emotional agility*. While *grit* helps sustain a powerful motivation to achieve any life goals, *resilience* allows ones to recover quickly from difficulties, given the global pandemic as an example. Furthermore, *emotional agility* is a self-management strategy to help people rapidly alleviate stress, adaptively tackle problems, and constantly improve performance. This paper therefore concludes that these psychological traits are necessary both in personal and educational aspects, thus more emphasis needs to be given to help equip our next generation to be capable of adapting to any changes that may come.

**Keywords:** Evolutionary biology; grit; resilience; emotional agility; COVID-19 pandemic

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## INTRODUCTION

The theory of evolution is considered to be a unifying theme in biology, as exemplified in Dobzhansky (1973, p. 125)'s famous claim that “nothing in biology makes sense except in the light of evolution”. Nonetheless, although evolutionary theory finds its roots in the biological sciences, its development has relied on the combined effort of professionals in other scientific disciplines ranging from chemistry and medicine to physics and geology, often engaged in observing, data collection and experimentation to enrich and validate the theory (Stearns and Hoekstra, 2005). The study of evolution is becoming ever more interdisciplinary as evolutionary models and frameworks are adopted by those working in domains as diverse as the social sciences and computer sciences. In addition, evolution also stimulates scientific development at the nexus of professionals in different fields. For example, Nadelson (2009) refers to the new field of evolutionary educational psychology which claims that our evolutionary history is an important factor to take into account in explaining aspects of cognition and learning. In addition, it is also central to research in a broad range of discipline areas such as evolutionary psychology, evolutionary anthropology, evolutionary medicine, evolutionary computation and evolutionary economics (Stearns and Hoekstra, 2005), as well as science education (Praputpittaya et al., 2020; Yasri & Mancy 2014; Yasri & Mancy 2016; Yasri, 2014; Yasri et al., 2013).

To be more explicit, evolutionary psychology argues that evolutionary processes have sculpted not merely the body, but also the brain where psychological mechanisms are activated which are believed as psychological adaptations designed to solve problems that historically contributed to survival and reproduction. Darwin provided a fundamental theory that guides much of modern psychological research: natural selection. The

theory has a great heuristic value, guiding psychologists to classes of adaptive problems linked with survival and reproduction. Wiles (2010, p. 18) defines the theory of evolution as the explanation of “the diversity of life on Earth [which] has arisen via descent with modification from a common ancestry”. It explains changes in species of living organisms over time as due to variation amongst individuals and processes of natural selection that lead to higher survival and reproductive rates of those best adapted to their environment, tending to increase the frequency of adaptive traits in the population (this process is often called “the survival of the fittest”, in which fitness is a relative measure of the extent to which a species is successful at survival and reproduction in a given environment). While variation is usually considered to arise randomly, natural selection provides direction to the process and takes the form of environmental pressures that differentially impact on individuals including availability of food, changes of climate, and other forms of competition between organisms living in the same territory (Stearns and Hoekstra, 2005). The isolation of subpopulations, through geography or genetic bottlenecks, can lead them to take different evolutionary paths, and induce speciation. Further, then, evolutionary theory purports that the current diversity of living organisms alive today originated from a small number of early ancestors (Charlesworth and Charlesworth, 2003). Being distinguishable from abiogenesis, the theory of evolution therefore explains the processes of change associated with all life including the emergence of modern humans and how we have evolved from our common ancestors with other apes (Stearns and Hoekstra, 2005).

During the pandemic of the coronavirus in 2020, there have been substantial changes in ways humans live our lives. In educational settings, learning and teaching have been transformed from traditional approaches like face-

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to-face interactions to online learning where students use technology and computer devices to interact with online information. In the business area, many have collapsed due to lockdowns. However, those who can adapt to such changes more quickly and effectively can become more competitive. On top of this, social interactions have been changed in many ways so that the term “new normal” has been widely used to describe new adaptive traits people react to the pandemic. In this paper, we highlight three psychological traits that are believed to point out characteristics of those being able to effectively adapt to those changes.

### **Grit: The psychological trait of passion and perseverance**

Grit is a non-cognitive trait (Strayhorn, 2014) that can be defined as individuals’ passion and perseverance of effort to achieve a particular long-term goal. Thus, it provokes people to work arduously and maintain the amount of interest and endeavour throughout unexpected adversity or failure (Duckworth, et al., 2007). In other words, grit also refers to the intrapersonal psychological strength to strive towards accomplishments aligned or separate from passionate pursuits (Kleiman, 2013). Duckworth also later added that grit is not just having resilience in the face of failure, but also having deep commitments that you remain loyal to over many years (Perkins-Gough, 2013). Hence, grit does mean to try hard. Instead, it means making long-term goals and devoting efforts without losing it to encountered obstacles during the process of achieving them (Lee & Kwon, 2016) as it is shown to associate with how people frequently exercise (Reed, 2014) and the time musicians use to practice (Miksza & Tan, 2015). Moreover, from recent study, it is not simply the ability to withstand the pain of effort and setbacks, or to resist the siren song of easier rewards; it is a trait or capacity that consists partly in a kind of epistemic resilience (Morton & Paul, 2019).

Regarding the definition of the term, grit can be considered as a successful measurement of long-term success (Lee, 2018). In fact, it correlates highly with the Big Five dimension of Conscientiousness which demonstrates incremental predictive validity of success measures beyond IQ where no positive associations are found. (Duckworth, et al., 2007). Therefore, it could be said that the contribution of personal traits to academic achievement may be as great as or greater than that of intelligence (Poropat, 2014). Furthermore, it is revealed that grit is related to the number of participants qualified to the final round of 2006 Scripps National Spelling Bee (Duckworth & Quinn, 2009), the graduation rate from US Military Academy (Eskreis-Winkler, et al., 2014), the dropout rate of West Point (Kelly, et al., 2014) and the overall college GPA (Bowman, 2015). Other researchers report that from examining the association between grit and work engagement, grit was a strong predictor for work performance (Suzuki, et al., 2015) and academic performance (Tang, et al., 2019). Other than that, grit is found to be related to the growth mindset where students who persevere when faced with challenges and perceive ability as a malleable skill possess it. (Hochanadel & Finamore, 2015). This attitude will make them believe that they can develop their intelligence over time (Dweck, 2010).

Having said that, it is essential to note that although grit and growth mindset share similar characteristics, both constructs differ in respect of their point of emphasis and neural correlates (Threekunprapa & Yasri, 2020a, 2020b).

By utilizing resting-state functional magnetic resonance imaging (fMRI), grit or the passion and perseverance of long-term goals was associated with ventral striatal networks (the neural crossroads that treat various aspects of reward processes and motivation) such as the connections between medial prefrontal and rostral anterior cingulate cortices (collaborate to form strategies for staving off distractions in the face of delayed reinforcement). On the other hand, growth mindset or the belief that effort could improve talent and intelligence was associated with both ventral and dorsal striatal connectivity such as dorsal anterior cingulate cortex (Myers, et al., 2016). Moreover, those who think intelligence is inherent and unchangeable exert less effort to succeed and have a fixed mindset which eventually becomes an obstacle that impedes the likelihood of engaging in counterfactual thinking (Vandewalle, 2012). From psychological well-being aspects, grit is found to positively related to psychological well-being, satisfaction with life, and harmony in life. It also suggests that in order for it to fully benefit well-being, the grittiness towards goal pursuits requires both a sense that the world is coherent and an authentic connection with themselves. (Vainio, et al., 2016).

From previous research, personal traits of grit refer to tendencies to act, think, and feel that are relatively stable across time and situation (Eid & Diener, 2006). By having grit, the quality that enables individuals to work hard and stick to their long-term passions and goals. More importantly, it is compulsory for them to grasp that there is nothing wrong to feel confused when learning something new. In addition, making mistakes or taking a long time to complete an assignment has to be included in part of learning, not a sign of failure. (Bashant, 2014). They also have to perceive how grit should be integrated with talent to maximize their potential. More specifically, the people who are ambitious and have no limit to how much they want to understand, learn or succeed are both talented and gritty (Perkins-Gough, 2013). Unlike gratitude and compassion, grit does not merely conform to interpersonal characters. Gritty people are also tenacious as they struggle against the odds to win, finish a difficult personal job, succeed in life, or survive (Malin, 2017). Interestingly, while the aforementioned traits are not new and actually seem old-fashioned, the approach to educate grit to students and how students can possess it is considered critical (Pappano, 2013).

When considering ways to build and improve grit, the surging visibility of it has prompted inquiries from some observers (Anderson, 2016). Primarily, it is stated that although children love praise for their intelligence and talent, praising children’s intelligence harms their motivation and confidence, thus their performance (Dweck, 2010). In addition, although, the definition of grit is more complex to simply find an exact way to implant grit in students (Willingham, 2016), a number of people have taken educated guesses about what might help kids to be gritter (Fink, 2013) which seems to be sensible. In regard to the achievement formula from Perkins-Gough (2013), Talent along with effort contributes to the acquired skill, and that skill multiplied by effort results in the desired achievement. Hence, consistency of effort in the long run is the main factor to reach accomplishments (Fitzgerald, 2016). As a result, ideas to help develop grit are to create abiding interests, an appetite for practice, a sense of purpose and maintain hope for students (Duckworth & Perkins-Gough, 2013). Another study

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clarifies the suggestions in which educators are advised to discuss the value of attitude and persistence, use pictures to assist students' visualization of problems, start from approachable tasks that are easy to solve, elaborate the relevance of the topic to students before teaching the actual concepts, establish an engaging environment in class by turning activities into games and competitions and reward those who are determined to study (Bashant, 2014).

Emphasizing on one's action to develop grit in themselves, although very little is known about the individual differences that contribute to grit (Eskreis-Winkler, et al., 2014), a study identifies that self-regulated passion is a motivational antecedent to grit, thereby extending people's understanding of how passion establishes and fuels pursuit of long-term venture goals (Mueller, et al., 2017). Thus, in order to develop grit in themselves, it is advised to initially alter their mindset and motivation, for instance, believing in the benefit and the importance, the effort or cost needed, and the likelihood of achieving the desired goal (Baruch-Feldman, 2017). An example would be when people demand to receive high grades in their education, they primarily have to perceive the advantages and significance that they would gain from it which includes a wider range of opportunities for their future profession. They also have to acknowledge that hard work and effort is required to perform well in assignments and examinations in order to accomplish desirable grades. Last but not least, they should be able to anticipate the chances of reaching their goal from their continuous endeavor. Nevertheless, having the right motivation and mind-set is not sufficient. People also need to turn that motivation into action, as Motivation (mind-set) and Volition (behavior) leads to success. Moreover, when selecting tasks to perform, people must be determined to accomplish them. In other words, they should choose a topic with regards to their interest and put effort into specific aspects that need the most improvement (Duckworth & Gross, 2014). Another research has found that people could develop grit in themselves by recognizing companion's perspectives; thus, they ought to surround themselves with people who are able to reflect optimistic and encouraging thoughts to them (Hogan & Larkin-Wong, 2013). In fact, recent research has revealed that the grit of a partner influences the grit of the other when they begin an attached life after their marriage. Therefore, a gritty partner can make a person be grittier or else the opposite. To elaborate, from an investigation performed in the upper middle socioeconomic families, when basic needs of both people are fulfilled, grit which is a non-cognitive factor will exert its influence on that particular factor to reach specific goals. Hence, it extends a healthy relationship in their post-adolescent life. (Kevin, 2020). Most importantly, in order to accomplish goals, people have to realize that mistakes are simply another learning and are an inevitable part of growth. Instead of being discouraged by mistakes, they should make people become grittier to reach success that involves consistency of effort and interest (Persellin & Davis, 2017).

### **Resilience: The psychological trait of being able to bounce back**

The term "Resilience" has heatedly been debated in psychology for a long period of time as the term itself has different, complex meanings which depend on an individual, a culture and a society, whether they specify it to be a trait, a process or an outcome. Resilience can be

defined in myriad aspects. The word "resilience" comes from the Latin word "resilens", which means a substance's elasticity quality" (Greene et al., 2002). The term is also identified as a capability to "bounce back from adversity, frustration and misfortunate" (Janas, 2002), which will later "progress in self responsibility" (Luthans, 2002). An alternative definition for the term is resilience refers to an ability to encounter stress-triggered events with no disturbance (Perry, 2002), including prompt recovery from tragic incidents (Bonnano, 2004; Mansten, 2014) as well as disasters (Southwick 2014). In addition, resilience depends on individuals whether they allow themselves to be overwhelmed by stress and adversity or survive and respond to challenges (Rutter, 1987). However, resilience may change as a function of development and the interaction of an individual with the environment (Kim-Cohen & Turkewitz, 2012). People could also be more resilient at one point in their lives, and less during other times (Southwick, 2014).

On the other hand, regarding the cultural implications, the definition of resilience changes depending on the environment and mastery experience of an individual. When conducting a study in Afghanistan, researchers used face-to-face interviews with Afghanistan people about their own definition of the word 'resilience' (Panter-Brick & Eggerman, 2012). The answer that researchers obtained was resilience that means 'hope'. They concluded that the Afghanistan people prioritised the future more than the past as it determined their present situations and well- beings as something that had already occurred in the past could not be changed. Likewise, according to Michel Ungar's research, which was conducted in 14 different countries (e.g., Columbia, China, Russia, Israel, etc.), he concluded that resilience could vary dramatically due to different aspects of culture and context (Ungar, 2008). As a result, rather than focusing on resilience of individuals, we should change people's level of resilience as it may increase the capacities of resilience in each individual. This will result in an increase in opportunities for them to achieve a better future (e.g., Reed, Fazel, Jones, Panter-Brick, & Stein, 2012). This leads to the idea of 'structural resilience', where quality education and facilities must be provided, so an individual can recognise their own potential (Ager, Annan, & Panter-Brick, 2013).

Exercising resilience can contribute to both curative and preventive methods for handling difficulties. Firstly, "the challenge model" suggests that if individuals face risk of an exposure event that is not too tragic, they will enrich their experience and deal with it in the future (O'Leary, 1988). For instance, when teenagers are exposed to a moderate level of risk factors, they can learn from it and adapt the knowledge when faced with a similar risky situation in the future. To illustrate this point further, in a situation such as a fire emergency, children are taught about an emergency action plan and how to respond to a fire emergency. Secondly, "the compensatory model" describes resilience as a method to prevent exposure to stressful events (Garmezy et al., 1984). This is supported by research of alcohol abstinence in adolescents which will lower the risks of suicide in adolescents (Andersson and Ledogar, 2008). Lastly, "the protective factor model" presents the idea that where risks are reduced, the chance of negative outcome will also diminish (O'Leary, 1988). According to Andersson and Ledogar's study, when young adults are no longer being exposed to drugs,

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they are less likely consume alcoholic drinks; thus, this means suicide is being diminished.

However, resilience contains several distinguishing characteristics which are different from optimism, hope and other features (Praputpittaya & Yasri, 2020). For instance, the characteristic of resilience is to be “proactive and reactive” in the situation of adversity. It is also acknowledged as the ability to “setbacks” and “bounceback” from tragedies and life-shattering experiences (Bonanno, 2004; Vogelgesan et al., 2006). Hence, resilience can be categorised as positive perspectives on risk factors that might be recognised as dangers that heighten the chance of negative consequence or lower the chance of positive outcome (Masten, 2001). In other words, resilience involves action and response to bounce back from tragedy. In contrast, optimism and hope is only a positive state of mind. To put it simply, hope and optimism best apply to situations that can happen with a scheme and can be explained by using distinguishable factors, while resilience contains the need for being flexible, adaptable and improvisable in particular situations (Coutu, 2002).

Taking everything mentioned above into consideration, resilience can be achieved by keeping things in perspective and identifying irrational thoughts. Accept that change is inevitable so as to increase flexibility. Being both optimistic and resilient at the same time will help an individual when dealing with difficult situations. Finally, learn from the past and make the future better (The American Psychological Association, 2020). There are several actions that everyone could do on a daily basis in order to increase their resilience. For example, they can have a walk and keep their body active as it will release endorphins into their body systems. They can also try to talk with someone with whom they feel comfortable and with whom they can have an honest conversation. Taking a deep breath every time, they are stressed might be helpful as well. Individuals who develop this personality trait are more prone to increase their “self-responsibility” and make them able to learn more actively and grow healthily because they have overcome difficulties (Luthans, 2007).

**Agility: The psychological trait of adapting to changes**  
Many people have talked about the term “Agility” or “Learning Agility” and have tried to propose a definition for it. The term “agility” was referred to as “the ability to learn from experience reflects a person’s ability to master the changing demands of his or her job” (Kolb, 1976). It was also defined as “an individual’s ability to learn comprises a diverse set of attributes and competencies, including but not limited to individuals’ intelligence (Hunter, 1986; Hunter & Schmidt, 1996), motivation to learn and seek out developmental opportunities (Birdi, Allan, & Warr, 1997; Colquitt & Simmering, 1998; Spreitzer et al., 1997), personality attributes such as Openness to Experience (LePine, Colquitt, & Erez, 2000), and the recognition of when new skills or behaviours are required” (Van Velsor et al., 2004). Agility was also explained as “the ability to do so quickly and in a variety of situations” (Tugade & Fredrickson, 2004; Tugade, Fredrickson, & Barrett, 2004). Later, in DeRue et al. 's (2012) work on searching a narrower definition of the term, they found that learning agility has largely been referred to synonymously with the ability to learn. They, then, defined learning agility as “the ability to come up to speed quickly in one’s understanding of a situation and move across ideas flexibly in service of learning both

within and across experiences.” They also proposed a framework of learning agility that was based on Lombardo and Eichinger’s work (2000) suggesting that there are two main compositions of learning agility which are speed and flexibility, corresponding to the meaning stated in the American Heritage Dictionary of English Language (2000) as “the power of moving quickly and easily; nimbleness” and “the ability to think and draw conclusions quickly; intellectual acuity”.

In terms of the application of this psychological framework, agility is essential as it is mentioned by Eichinger and Lombardo’s work (2004, p.12) that “the construction of learning agility originated from the issue of identifying high-potential employees who are capable of performing successfully within a dynamic environment.” It is also stated in Neubert et al.’s (2015, p. 242) work that “the relation between learning agility and the trend toward nonroutine and interactive features in the workplace is straightforward.” For instance, it is important to select an employee with high agility so that he or she can adapt or react to various unpredicted situations that might happen. Considering on a bigger scale, in Baran and Bible’s (2019) work, it is suggested that “At the team level, agility builds upon what we know about high-performance teams to incorporate behaviors and mindsets that facilitate sensemaking and rapid decision making.” Additionally, agility, as a business trait, can benefit the organization in various approaches. In Gligor et al.’s (2019) work, they provide 6 themes on agility’s abilities to benefit the company including ability to quickly change direction, ability to speed/accelerate operations, ability to scan the environment/anticipate, ability to empower the customer/customize, ability to adjust tactics and operations (flexibility), and ability to integrate process within and across firms.

In Mitchinson & Morris’s (2014) work, the Learning Agility Assessment Inventory (LAAI) and the Workplace Big Five Profile personality assessment were carried out, the results from high learning-agile individuals share some similar traits including they are more extroverted (they are more sociable, more active, and more likely to take charge), they are more focused (they are more organized, more driven, more methodical, and they continually refine and polish), they are more resilient (they are more “at ease”, more calm, more optimistic, and they rebound from stressful events more quickly), they are less accommodating (they are more likely to challenge others, welcome engagement, and express opinions), and they are more original (they seek complexity, readily accept change and innovation, and are more likely to create new plans and ideas).

Furthermore, in their research, they also provide tips and suggestions for becoming more agile by mentioning 4 Learning Agility “Enablers” which are Innovating, Performing, Reflecting, and Risking, and 1 Learning Agility “Derailer” which is Defending. To develop one’s agility, development activities and personal challenges are suggested: Innovating (when facing a problem, challenge yourself to come up with new solutions, try brainstorming new ideas, and analyze the problem), Performing ( try to find similarities when facing something new, ask questions to understand, and take a moment and think when you feel stressed), Reflecting (find someone you trust to give you open and honest feedback and challenge that person to do so, and conduct After Action Review where you and others reflect on recent projects), Risking (simply try new challenges that

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scare you), and Defending (consider feedbacks as a gift from someone, and resist the temptation to respond to feedback).

### CONCLUSION

Based on the evolutionary lens, it is believed that almost all aspects of life can be explained by this mechanism of "natural selection", and thus those who are adaptive to sudden changes are more likely to "survive" regardless of their field of expertise; whereas those who remain static are prone to become "extinct". Based on the existing literature, three psychological characteristics are considered as adaptive traits: *grit*, *resilience*, and *emotional agility*. While *grit* helps sustain a powerful motivation to achieve any life goals, *resilience* allows ones to recover quickly from difficulties, given the global pandemic as an example. Furthermore, *emotional agility* is a self-management strategy to help people rapidly alleviate stress, adaptively tackle problems, and constantly improve performance. This paper therefore concludes that these psychological traits are necessary, and more emphasis needs to be given. Educators in any fields of study are suggested to consider helping their students to cultivate these skills and reflect up on them (Maneejak & Yasri, 2019) so that their children would become more capable to face challenges that may arrive in the future.

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