

J. Aray<sup>1\*</sup> , E.K. Kalimbetova<sup>1</sup> , Slanbekova G.K.<sup>2</sup> 

<sup>1</sup>Al-Farabi Kazakh National University, Kazakhstan, Almaty

<sup>2</sup>Karagandy Buketov University, Kazakhstan, Karaganda

\*e-mail: Jarken.aray@mail.ru

## THE EFFECT OF DIFFERENT AROUSAL EMOTIONS ON GRIT

Grit, which is defined as the will to achieve long-term goals and overcome difficulties, is an important resource of the individual in addition to intelligence. Emotions can activate people's behavioral tendencies. Modern research shows that certain negative emotions can affect people in different ways. The purpose of this article is to study the differentiated influence of various emotions on persistence. The target group of the study is young people aged 18 to 25 years. Anger, disgust, fear, sadness, happiness, and relaxation were defined as independent variables, and participants' scores on the endurance questionnaire were selected as the dependent variable. Harmon-Jones "Discrete Emotion Questionnaire" and Duckworth's "Short Grit Scale" were used to measure emotion and grit. The results of the study showed that subjects in an emotional state of happiness and anger have a higher level of grit than subjects in a neutral emotional state. In a state of disgust, individuals increase perseverance than under the influence of neutral emotions. In addition, the state of sadness and fear affects the decrease in the level of grit. These studies provide preliminary evidence for the impact of different emotions on persistence. The practical significance of the study lies in the application of empirical data on the differentiated influence of specific negative emotions on human behavior in the regulation of the motivational-demand spheres of the personality.

**Key words:** academic performance, discrete emotions, grit, negative emotions, positive emotions.

Ж. Арай<sup>1\*</sup>, Э.К. Қалымбетова<sup>1</sup>, Г.К. Сланбекова<sup>2</sup>

<sup>1</sup>Әл-Фараби атындағы Қазақ ұлттық университеті, Қазақстан, Алматы қ.,

<sup>2</sup>Е.А. Бөкетов атындағы Қарағанды университеті, Қазақстан, Қарағанды қ.,

\*e-mail: Jarken.aray@mail.ru

### Әртүрлі қозу эмоцияларының табандылыққа әсері

Ұзақ мерзімді мақсаттарға жету және қиындықтарды жеңу ерік-жігері ретінде айқындалатын табандылық жеке тұлғаның интеллектімен қатар маңызды ресурсы болып табылады. Эмоциялар адамдардың мінез-құлық тенденцияларын белсендіруі мүмкін. Қазіргі заманғы зерттеулер белгілі бір жағымсыз эмоциялардың адамдарға әртүрлі әсер етуі мүмкін екенін көрсетеді. Бұл мақаланың мақсаты – әртүрлі эмоциялардың табандылыққа сараланған әсерін зерттеу. Зерттеудің мақсатты тобы – 18 бен 25 жас аралығындағы жастар. Ашу, жиіркеніш, қорқыныш, қайғы, қуаныш және релаксация тәуелсіз айнымалылар ретінде анықталды, ал тәуелді айнымалы ретінде қатысушылардың төзімділік сауалнамасындағы ұпайлары таңдалды. Эмоция мен табандылықты өлшеу үшін Хармон-Джонстың «Эмоцияның дискретті сауалнамасы» және Дакворттың «Табандылықтың қысқаша шкаласы» пайдаланылды. Зерттеу нәтижелері бейтарап эмоционалдық күйдегі субъектілерге қарағанда бақыт пен ашудың эмоционалдық күйіндегі субъектілердің табандылық деңгейінің жоғары екенін көрсетті. Адамдар бейтарап эмоциялардың әсерінде болған күймен салыстырғанда жиренішті күйде табандылықты танытады. Сонымен қатар, қайғы мен қорқыныш күйі табандылық деңгейінің төмендеуіне әсер етеді. Бұл зерттеулер әртүрлі эмоциялардың табандылыққа әсері туралы алдын ала дәлелдер береді. Зерттеудің практикалық маңыздылығы адамның мінез-құлқына жағымсыз эмоциялардың сараланған әсері туралы эмпирикалық мәліметтерді тұлғаның мотивациялық-қажеттілік салаларын реттеу кезінде қолданумен байланысты.

**Түйін сөздер:** академиялық жетістік, дискретті эмоциялар, жағымсыз эмоциялар, оң эмоциялар, табандылық.

Ж. Арай<sup>\*1</sup>, Э.К. Калымбетова<sup>1</sup>, Г.К. Сланбекова<sup>2</sup>

<sup>1</sup>Казахский национальный университет им. аль-Фараби, Казахстан, г. Алматы,

<sup>2</sup>Карагандинский университет им. Е.А. Букетова, Казахстан, г. Караганды,

\*e-mail: Jarken.aray@mail.ru

### Влияние различных эмоциональных возбуждений на усидчивость

Настойчивость, которая определяется как воля к достижению долгосрочных целей и преодолению трудностей является важным ресурсом личности в дополнение к его интеллекту. Эмоции могут активировать поведенческие наклонности людей. Современные исследования показывают, что определенные негативные эмоции могут по-разному влиять на людей. Целью данной статьи является изучение дифференцированного влияния различных эмоций на настойчивость. Целевая группа исследования - молодые люди в возрасте от 18 до 25 лет. В качестве независимых переменных определены гнев, отвращение, страх, печаль, счастье и расслабление, зависимой переменной выбраны баллы участников по опроснику выносливости. Для измерения эмоции и настойчивости применены «Дискретный опросник эмоций» Хармона-Джонса и «Краткая шкала настойчивости» Дакворта. Результаты исследования показали, что испытуемые в эмоциональном состоянии счастья и гнева имеют более высокий уровень настойчивости, чем испытуемые в нейтральном эмоциональном состоянии. В состоянии отвращения у индивидов увеличивается настойчивость, чем под влиянием нейтральных эмоций. Кроме того, состояние печали и страха влияет на снижение уровня настойчивости. Данные исследования служат предварительным доказательством влияния различных эмоций на настойчивость. Практическая значимость исследования заключается в применении эмпирических данных о дифференцированном влиянии специфических негативных эмоций на поведение человека в регуляции мотивационно-потребностной сфер личности.

**Ключевые слова:** академическая успеваемость, дискретные эмоции, настойчивость, отрицательные эмоции, позитивные эмоции.

### Introduction

Grit is an attribute defined as “the trait of tenacity and passion for completing long-term goals”. Grit is made up of two lower-order traits that are related to higher-order traits: persistence and continuity. The ability to maintain interest and consistency in a task while being distracted by other factors is referred to as continuity. Persistence is the ability to persevere even when it is difficult, even if the task goal takes a long time to achieve. These are reflected in two self-report scales for perseverance measurement: Grit Scale (Duckworth, 2007) and Short Grit Scale (Duckworth, 2009:172).

Many studies have proved that grit has a great predictive effect on academic achievement and career success (even more so than intelligence and cognitive ability) and is a core factor of personal success (Vallerand, 2014:90). There is a strong correlation between perseverance and academics, such as GPA, academic self-efficacy etc. GPA has good prediction results of the students, and in terms of academic performance at the higher level students perseverance will be better (Aparicio, 2017:392), they can better use of their capabilities, complete the short-term goals can be better control of their time and energy, make the attention is not scattered, they will have more time and energy to plan and deploy learning strategy (Richardson, 2012:353), Keep good

learning habits and improve learning skills (Credé, 2008:430). Therefore, it is relatively easy to obtain higher academic performance (Wolters, 2015:302). Persistent students have lower rates of academic or test anxiety (Hembree, 1988:60) and they will be educated for a longer period and have a higher level of education than those with low levels of perseverance. Those with high levels of perseverance also adapt well to new environments and cope well with problems and difficulties in life, work, and school (Credé, 2012:143). And the level of perseverance will gradually increase with years of time, for example, students in college will have a higher level of perseverance than students in high school. When it comes to learning a foreign language, perseverance has a big impact on people’s foreign language performance, when learning a foreign language, some students may feel tremendously challenged, which can lead to negative emotions like boredom, worry, and burnout. Grit will make students more determined to learn a foreign language and devote more energy to it, improving their language academic performance, and such outcomes will improve learners’ satisfaction (Von Culin, 2014:310), They will also be more willing to communicate with others and will greatly increase their confidence in learning a foreign language (Lee, 2020:57).

The difference in people’s perseverance can explain the obvious difference in the work performance

of people with the same ability level in the same field. Individuals with high perseverance can maintain themselves well in the face of external temptations and will not deviate from their goals even in the face of short-term goals, even though they may not get the expected feedback and results, and they can use their abilities appropriately. Furthermore, they are more likely to be brought up in interest when they encounter some challenges. Motivation for the goal also becomes strong. There is greater confidence in completing the task, in contrast, if the task is not challenging or relatively easy, they may not be interested (McClelland, 1985:812). This challenge motivation is very important for individuals who want to gain a sense of accomplishment.

Perseverance is also highly correlated with other factors for individuals to achieve success, and they affect each other. For example, individuals with high perseverance also have strong self-control. Self-control is the ability to resist and suppress impulses in the face of temptation. Like motivation, it is one of the indispensable conditions in the process of completing tasks and achieving achievements. While self-control can affect an individual's persistence, it may only affect short-term, simple goals. For example, in the face of long-term and short-term interests, when individuals choose long-term interests, they need to control themselves to resist the temptation of short-term interests. But self-control will fail when faced with a long-term effort to maintain, and perseverance is needed to push the individual to implement (Duckworth, 2014:322). Individuals with high motivation can persevere well when completing tasks, which may also explain individual differences (Zhamuldinov, 2011:129), that is, people pursue different goals and happiness, and choosing timely enjoyment or higher goals will affect the individual's own level of perseverance.

Within the organizational context, there is no direct evidence of a relationship between perseverance and career performance, and most studies provide only indirect evidence (Ion, 2017:165). The relationship between performance and perseverance may be limited by domain; perseverance can be a good predictor if there is a clear goal task or military training, for example, but there may not be a strong correlation between the two when there is a need for areas such as creativity, and the relationship may be influenced by individual differences, such as ability and metacognition (Crede, 2011:340). That is, if there is no ability or potential in each domain, as well as self-control and self-regulation, persistence may instead lead to the ineffective effort. For example, in

the case of very difficult problems, persistence can reduce the probability of help-seeking behavior and ignoring other relatively easy tasks, leading to a decrease in efficiency (Halliday, 2017:1770). Failure to realize the problem or find the right strategy, high levels of perseverance can instead have the opposite effect.

In addition to overcoming academic difficulties, perseverance is also effective in other areas, as interventions can reduce people's anxiety and burnout (Lucas, 2015:18), they will not be easily intimidated when facing setbacks and difficulties at work and will have less intention to leave their jobs (Jordan, 2018:23), and will be healthier and can well resist the temptation of drugs and the risk of drug addiction, and their fitness habits and good It is also possible to maintain good fitness habits and good work habits. It can also enhance personality traits such as self-awareness and emotional intelligence. Enhances control over self and personal skills. Improving people's happiness, life satisfaction and job satisfaction (Datu, 2018:266).

### **The connection between emotions and grit**

Numerous studies have shown that emotions play an important role in individuals' motivation, interpersonal resources, memory, learning, and academic achievement (Valiente, 2012:129). As an information input, emotion can affect our information processing process, and individual cognitive processing strategies will be adjusted to an appropriate mode to cope with the requirements of the environment. As a result, negative emotions can elicit bottom-up systematic analytical thinking. to explore the appropriate course of action, individuals will carefully evaluate their environment. Positive emotions cause top-down loosely divergent thinking, and people will use heuristic cognitive processing mode instead of putting in a lot of cognitive effort, resulting in more creative exploration and flexibility (Schwarz, 2003:298).

Perseverance is a relatively new topic in emotional research. There haven't been many has been done on the effects of different emotions on perseverance, but there have been a few on other topics, such as the positive effects of positive emotions on cognitive ability and creativity, ego-efficacy, and self-control. Positive emotions can expand an individual's sequence of instantaneous thinking activities and action categories and encourage individuals to break through certain constraints to produce more thoughts, improve cognitive flexibility, broaden the

scope of attention, and generate interest and action for exploration, all of which have a spreading effect and gradually form persistent personal resources.

Negative emotions can interfere with an individual's thinking and judgment, but recent studies on self-control suggest that different emotions may have different effects on self-control. For example, guilt can inhibit undesirable behaviors such as eating late-night snacks, smoking, and making impulse purchases (Zemack-Rugar, 2007:927). Angry people are more decisive in their decisions, do not postpone their choices, are less biased in choosing compromise options, are more satisfied with the options made, and have more goal congruent behaviors. People who experience emotions of regret in a particular domain or matter will make more careful and correct decisions in the same domain (Nelson, 2010:12). Khan (2010) discovered that sad emotions can improve individual self-control and Self-discipline in a later study. Positive and negative emotions can have different effects on priming and inhibitory self-control. FTC Schmidt (2017) discovered a strong correlation between perseverance and self-control, but the structure of perseverance and self-control differed, which could provide indirect evidence for the influence of specific negative emotions on perseverance. This paper will delve deeper into the impact of various discrete emotions on perseverance.

### Research methodology

*Purpose and content of the study.* This study examined whether different states of emotional arousal affect perseverance. To investigate whether there are differences in subjects' perseverance under different emotions (anger, disgust, fear, sadness, happiness, and relaxation), where the independent variable is the subject's emotional state and the dependent variable is perseverance.

A total of 48 subjects, 21 males and 27 females, were enrolled in this study using a convenience sampling method. The subjects' ages were distributed between 18 and 25 years, and all subjects had normal visual or corrected visual acuity and hearing and no mental illness. The subjects were randomly assigned to 6 discrete emotional groups, 8 individuals in each emotional group.

*Research Procedure.* Prior to the start of the experiment, subjects were informed that the results were for academic research only and that subjects could react according to the truth. The study consisted of three parts: video screening, pre-experimental test, emotional arousal, and post-experimental test.

Before the start of the formal experiment, the subjects were shown videos of different emotionally arousing videos, filled out a self-report, and finally a score was calculated to select the video clip relative to each emotion. Before the start of the experiment, the subjects' pre-experimental perseverance level was measured with a perseverance questionnaire: at the beginning of the experiment, emotional arousal was performed according to different videos, and the videos were played in the form of slides for about 3 to 6 minutes; after the experiment, the subjects' emotional state after watching the movie clips was measured with an emotional rating questionnaire, and then the subjects' post-experimental perseverance level was measured by filling in the perseverance questionnaire again. After the experiment, the subjects in the negative emotional arousal group were given emotional calming and psychological counseling, so that the subjects were psychologically and emotionally calmed. And a gift was given to each participant.

Movies are effective in inducing emotions, and Westermann (1996) showed that movies/stories are most effective in inducing both positive and negative emotions through post hoc analysis. The main reason for this may be that in a laboratory setting, movies are one of the easiest methods to operate, can elicit strong reactions in a short period, and temporarily remove the problem of moral practice. Five movies were screened through the survey, and 12 movie clips were cut from them. The subjects were divided into groups to watch different emotionally arousing videos, with the positive emotion arousal group being Happy, the neutral emotion arousal group being Relax, and the negative emotion arousal group being Anger, Disgust, Fear, and Sadness. Filling out a self-report, which was a 9-point scale that allowed the subjects to score the degree of emotional arousal of each video on a scale of 1-9, was used to assess the video clips' emotional arousal effectiveness. Where 1 denotes "not at all" and 9 denotes "very strongly." Finally, the total score of all subjects in each video material was calculated, and the final six emotionally arousing video clips corresponding to the six emotions were selected.

*Emotional measurement.* Using the Harmon-Jones' Discrete Emotion Questionnaire (DEQ), which is sensitive to eight different state emotions, only six emotions were required for this study, and two emotion rating words were eventually removed. Respectively desire and disgust. The six remaining emotional states were sadness, anger, fear, disgust, relaxation, and happiness. The questionnaire was

rated on a 7-point Likert scale from 1 (Not at all) to 7 (An extreme amount). coefficient of 0.73

**Grit Measurement.** Duckworth’s Short Grit Scale was used to measure individual differences in perseverance scores. The scale consists of two dimensions, the first being the duration of interest, which reflects the individual’s ability to sustain interest over time, and the second being the duration of effort, which reflects the individual’s ability to sustain effort in the face of hardship and boredom. The questionnaire consists of 12 items on a 5-point Likert scale from 1 (very unconfirming) to 5 (very confirming), with four of the items taking reverse scoring. coefficient 0.85.

**Findings and analysis**

*Emotional induction effect analysis.* The emotion ratings were first processed to exclude data with an emotional arousal level less than 3. This ensured that the movie clips aroused the appropriate feelings. To ensure that the number of subjects in each mood group was equal, 30 subjects were chosen, with 20 in of the four negative mood arousal groups, 5 in the positive mood arousal group, and 5 in the neutral mood arousal group.

**Table 1** – Descriptive statistics of arousal for six different types of emotional videos (M(SD))

Activated Emotions m±sd		
Negative emotions group	Anger	6.111±0.782
	Disgust	6.111±0.782
	Fear	5.111±0.928
	Sadness	5.556±0.527
Neutral Emotion Group	Relaxation	4.000±0.000
Positive Emotions Group	Happiness	5.714±0.488

The subjects’ emotional arousal levels after watching the video are shown in Table 1, and the subjects’ average emotional arousal level was greater than 4 (1-3 for low arousal, 4 for moderate arousal, and 5-7 for high arousal). This indicates that the induction video was effective in activating the relevant emotional states of the subjects, as expected from the experiment.

*Differences in grit levels based on emotional arousal.* The data collected via the questionnaire was analyzed using Spss26.0 software. Six extreme data points were deleted following the experiment. There was no difference in the subjects’ data before

and after the activation of positive and negative discrete emotions, which would have affected the experimental results.

The paired sample T-test was used to see if there was a difference in the mean value of perseverance before and after different emotional activation, and the results were as follows (Table 2). Test 1 is the score for perseverance before emotional activation. Test 2 is the perseverance score after emotional activation.

**Table 2** – Difference of Grit in 6 discrete emotion Arousal states (N=42)

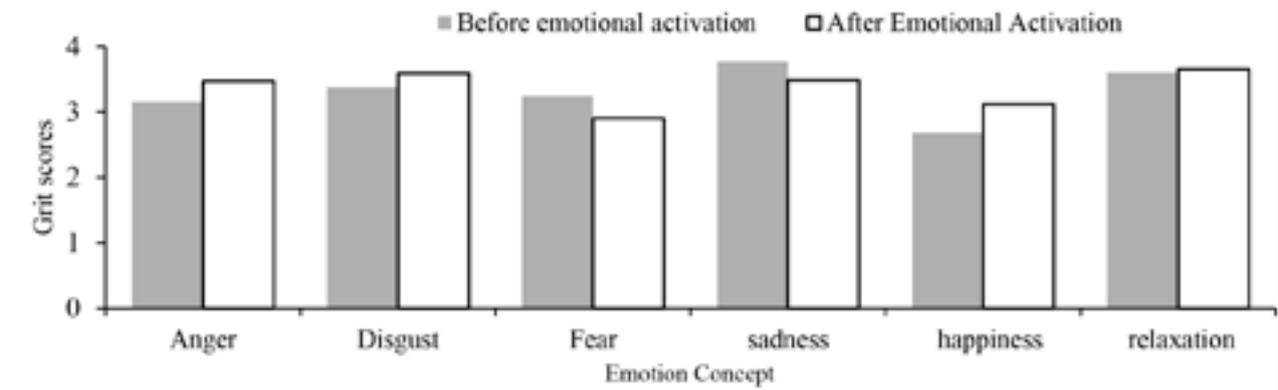
	M±SD			t	p
	Test 1	Test 2	Pairing difference (Test 2-Test 1)		
Anger	3.16±0.99	3.47±0.95	0.314±-0.045	3.355	0.015*
Disgust	3.37±0.53	3.59±0.49	0.211±-0.045	5.198	0.002**
Fear	3.24±0.53	2.90±0.43	-0.343±-0.103	-5.605	0.001**
sadness	3.77±0.33	3.49±0.34	-0.286±0.014	-10.954	0.000**
happiness	2.69±0.64	3.11±0.66	0.429±0.018	5.738	0.001**
relaxation	3.60±0.50	3.66±0.49	0.443±-0.128	1.922	0.103

\* p<0.05 \*\* p<0.01

Participants in the anger, disgust and happy groups showed increased levels of persistence during the test compared to before the emotion was activated. To investigate the difference of experimental data, paired-sample T-test was used. As can be seen from the above table, 5 of the 6 pairs of data presented travel variability (P< 0.05). Anger T=3.355, p< 0.05 and aversion T=5.198, p< 0.05. There was a significant difference between the levels of perseverance before and after awakening. The specific comparison shows that anger arousal (3.471±0.953) was significantly higher than that before emotion activation (3.157±0.998). Anger is positively correlated with persistence and has a positive effect. After the activation of disgust (3.586±0.488) was significantly higher than before the arousal (3.374±0.533). Aversion was positively correlated with perseverance. Consistent with the hypothesis. T=-5.605, p< 0.01 and sadness T=-10.954, p< 0.01. There was a significant difference in perseverance level before and af-

ter awakening. The difference showed that after fear activation ( $2.9 \pm 0.432$ ) was significantly lower than before emotion awakening ( $3.243 \pm 0.535$ ), and fear was negatively correlated with perseverance. After the activation of disgust ( $3.486 \pm 0.339$ ) was significantly lower than before the arousal ( $3.771 \pm 0.325$ ), disgust was negatively correlated with persever-

ance. There was a significant difference between the level of perseverance before and after happy emotion awakening ( $t=5.738$ ,  $P < 0.001$ ), happy emotion activation ( $3.114 \pm 0.657$ ) was significantly higher than that before emotion arousal ( $2.686 \pm 0.639$ ). A happy mood is positively correlated with perseverance.



**Figure 1** – Differences in perseverance before and after the experiment in different mood groups (N = 42)

## Discussion

This study focused on the relationship between different emotions and perseverance. The results of this study showed that subjects in a happy state had higher levels of perseverance compared to a relaxed mood; subjects in an angry and disgusted mood also had significantly higher levels of perseverance compared to a relaxed mood, while subjects in a sad and fearful mood had significantly lower levels of perseverance. The results of this study support the opening hypothesis. Few of the existing studies have conducted in-depth research on the role of discrete emotions. In particular, the role of emotions on perseverance is almost non-existent. This paper argues that negative emotions like anger can have a positive impact on decision making. In certain decision-making contexts, anger may shape good outcomes. In a study on self-control, it was noted that “negative emotions increase levels of self-control” (Zemack-Rugar, 2011:927). The results of the experiment showed that anger plays an important role in the tendency and type of decisions made by individuals and in their long-term satisfaction with themselves. Anger is less likely to go into local details when individuals are making decisions, which in turn reduces decision bias from paying too much attention to local details during the decision-making

process, which in turn increases decision satisfaction. The strong correlation between perseverance and self-control was also demonstrated in Schmidt’s (2017) study. This can further support the results of the present experiment. It was also mentioned before that self-control and perseverance are inextricably linked, with self-control being the ability to influence an individual’s perseverance in the face of short-term and easy goals, while perseverance is the ability that an individual needs when faced with long-term and tedious tasks.

Research has long suggested that positive emotions have a positive impact, but there is also a lot of research that suggests that extreme positive emotions can cause individuals to be overconfident and cause them to make poor decisions, reduce self-control, or lead to fruitless persistence. Although negative emotions have been studied for their negative effects on the human body, because of their prevalence in our lives, they should not be dismissed, but rather understood and how to master and transform them into the motivation we need.

The effects of anger are unique and different from other negative emotions (such as sadness). Emotion-regulating cognitions (thoughts about behaviors that are conducive to achieving a goal) influence goal-related behaviors, and these cognitions may only influence behaviors when the goal is posi-

tive. Anger is a constructive force. When an individual is angry, the body activates sympathetic nerves and releases adrenaline, and the mental arousal puts the body in a hyperactive state, narrowing the individual's cognitive range so that the individual can only produce certain specific behaviors in this situation and mobilize the individual's physical energy to respond to specific environmental challenges. In this situation, the individual develops a positive feeling about the goal and task, and his or her determination to achieve it. The individual's level of perseverance is increased. The tendency to act after emotional activation may become automatic, thus influencing behavior beyond conscious awareness.

This study provides some experimental hypotheses and references regarding the effect of discrete emotions on perseverance, but there are some shortcomings in the study. 1) The subjects selected for this study were college students and graduate students, which belong to a single group type. The number of subjects in this study was small, and the study could be expanded to more subjects and groups in the future to make the results more representative. 2) There was no time interval for the experiment, and no data on long-term perseverance were reported. The duration of activation may be relatively short and the effects on behavior may diminish over time. 3) The measures of emotional arousal states in the study were obtained through subjective reports of the subjects, and although they also served the purpose of detecting

their emotional level, they are still less accurate than objective indicators. In addition, this study only focused on the effect of emotional arousal state on the outcome of perseverance level and did not involve the study of individuals. In addition, this study only focused on the effect of emotional arousal state on the outcome of perseverance level and did not investigate how the individual's self-deception process-emotional state during emotional arousal-influences perseverance. This point can be further investigated in future studies through other techniques.4) The data on perseverance in this study were obtained through subjective reports of the subjects without realistic manipulation and testing, and future studies can further observe the effects of emotional arousal on individuals.

### Conclusion

This paper examines the effects of different emotional states on people's perseverance levels, providing preliminary evidence for the study of the relationship between emotion and perseverance. and provide empirical support for the study that specific negative emotions affect individuals differently. The conclusions suggest that people in happy and angry emotional states have higher levels of perseverance compared to the neutral emotion group. Individuals in aversive moods also had increased levels of perseverance compared to neutral moods. In addition, those in sad and fearful emotional states had lower levels of perseverance.

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