

CONTROL AND EMOTIONAL REACTIVITY LEVELS: WHICH ONE, POSITIVE OR NEGATIVE EMOTIONAL REACTIVITY LINKS WITH EFFORTFUL CONTROL?

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Received: 09th January 2020/ Revised: 24th February 2020/ Accepted: 16th March 2020

How to Cite: Hurriyati, E. A., Fitriana, E., Cahyadi, S., & Srisayekti, W. (2020). Control and emotional reactivity levels: Which one, positive or negative emotional reactivity links with effortful control?. *Humaniora*, 11(1), 35-43.
<https://doi.org/10.21512/humaniora.v11i1.6188>

ABSTRACT

The research investigated the relationship between effortful control and emotional reactivity in students. It also analyzed the description of each variable clearly based on the levels of effortful control and the level of emotional reactivity. The method was by self-report through questionnaires distributed to students aged 18-30 years. There were 357 participants that were consisting of 94 male students and 263 female students. The measuring instrument was the Effortful Control from the Adult Temperament Scale Questionnaire (ATQ) Scale-Short form, and the Perth Emotional Reactivity Scale-Short Form scale. The result shows that there is a positive significant relationship between effortful control and positive emotional reactivity. However, the research shows that there is a negatively significant relationship between effortful control and negative emotional reactivity. It states that students with high levels of effortful control have high positive emotional reactivity. Likewise, students who have low levels of effortful have low positive emotional reactivity. However, individuals who have a high level of effortful control have low negative emotional reactivity and vice versa.

Keywords: *effortful control, emotional reactivity, university students*

INTRODUCTION

Students who are at the stage of young adulthood are faced with many challenges during the transition from adolescence to adulthood. Prince-Embury, Saklofske, and Nordstokke (2016) have stated that challenges vary, ranging from entering university or entering the workforce to establish a relationship and plan future. According to Galatzer-Levy, Burton, and Bonanno (2012), Stelnicki, Nordstokke, and Saklofske (2015), post-secondary education may be able to produce stressful experiences, including managing the increased independence, building a new relationship, reaching and choosing a career. However, some students can cope well with their future, although it can be full of challenges. In other words, there are

individual differences.

Checa, Rodríguez-Bilón, and Rueda (2008) have stated that there is empirical evidence that individual differences can influence students' adaptation to be academic and social demands. Crone (2009) has said the transition from childhood to adolescence and then to adulthood is characterized by a consolidation of personal autonomy and independence. All of this progress is mediated by strengthening control skills (Crone, 2009). Many theorists and researchers have found a positive relationship between effortful control (EC) on the one hand and academic achievement and good social adjustment on the other (Liew, 2011; Checa, Rodríguez-Bailón, & Rueda, 2008).

Evans and Rothbart (2007) have stated that effortful control (EC) is an aspect of temperament that

reflects self-regulatory skill. Effortful control involves the ability to inhibit impulses and prevent disruptive behaviors (inhibitory control), to focus and maintain attention despite distractions (attention control), and to initiate and complete tasks that have long-term value, even when they are unpleasant—activation control (Rothbart & Bates, 1998). Rothbart, Sheese, and Posner (2007) have defined effortful control as a set of neurocognitive competencies that are relevant to self-regulation and educational attainment.

The research tests the hypothesis that effortful control in adolescents (age 17) will be predictive of academic persistence and educational attainment in mature age (ages 23-25) with control of other established predictors, such as familial factors, the behavior of air problems, the value of the average academic, and drug use. Some other studies predict academic achievement and social behavior. Liew, Eisenberg, and Reiser (2004), and also Liew et al. (2008) have measured effortful control and academic achievement of 6-year-old children in longitudinal studies for three consecutive years (Posner & Rothbart, 2007). The results of the research show a positive correlation between control and literacy and mathematics achievement in first-year students.

Checa, Rodríguez-Bailón, and Rueda (2008) have reported that adolescents with much better source control have higher academic achievement, especially in mathematics, and more preferred their classmates based on the sociometric test. Therefore, it is concluded that effortful control correlates positively towards the achievement of the academic in children and adolescents. Research performed by Véronneau et al. (2014), has stated that effortful control seems to be a picture of the core of competencies regulations. They are associated with the achievement of the success of education in the early period of adulthood. This finding shows that the promotion of self-regulation in general and business controls, in particular, can be an important focus not only on resistance to stress and avoiding problematic behavior but also on the growth of academic competence.

Effortful control EC is the basic dimensions of temperament that mediates between voluntary behavioral control and regulation of emotional reactivity (Derryberry & Rothbart, 1997). It involves the regulation of emotions, thoughts, and behaviors, as well as the successful settlement of conflict (Posner & Rothbart, 2007). The EC dimension relates to the efficiency of executive attention in changing and focusing attention, inhibiting inappropriate behavior (inhibitory control), activating or taking action when there is a strong tendency to avoid it (activation control), and with the integration of information and action planning (Evans & Rothbart, 2007; Eisenberg, 2017). EC is inherited and shows moderate stability from time to time, but its development is also shaped by experience (Liew, Eisenberg, & Reiser, 2004; Eisenberg, 2017). Research in children and adolescents has shown that the EC deficit prevents the development of high-quality social functions (Eisenberg et al., 2000).

The EC deficit during childhood and adolescence is associated with interpersonal difficulty in the later stage of development. However, the relationship between EC and interpersonal function in adulthood has not been fully established. Relationships are established between the EC, and the adjustment of social on children is important. It shows that the EC is a buffer or protection against the interpersonal development or the difficulties through an increase in durability (Eisenberg et al., 2000).

In other words, children with high EC can modulate attention and conduct them. It can reduce behavior problems through an increase in the ability to manage their negative state of emotion, as well as to recover and adjust themselves from the negative experience. It is because the EC would allow children to reduce the difficulties related to the experience of negative through an increase in its ability to overcome the difficulties of interpersonal. In contrast, individuals with low EC are directly at risk for developing interpersonal problems that relate to their ability and experience interpersonal mismatch on their next stage. Besides, it can be said that the EC plays a role in the individual at the time of facing the experience of emotion.

Emotions can be a valence of positive (e.g., happy) or negative (e.g., sad), and as a response which is manifested through a system of emotions, experiences (feeling sad), physiological (increased rate of the heart), and behavior (aggression due to anger) (Evers et al., 2014). However, the response of individuals to experience is emotionally dependent on the reactivity of emotional people.

Derryberry and Rothbart (1997) have defined emotional reactivity as the speed and power of an individual's negative emotional response. Three aspects of the emotional functional reactivity are the sensitivity, the length of time of recovery from disturbance of emotions, and disruptions or level of impaired function associated with the disturbance of emotions. Emotional reactivity (sensitivity, intensity, and persistence of emotional experiences) is conceptualized as a component of temperament that influences why and how an individual responds to their experience (Nock et al., 2008).

Based on the exposure that has been discussed, the research assume there is a significant relationship between the EC and individual emotional reactivity that affects people to have trouble adjusting themselves in both academic and social environments. Research on the relationship of EC with emotional reactivity still has not been much studied in young adults, in the context of the higher education level student. Researchers suspect that the individual student who has high EC will have a low negative emotional reactivity. Therefore, individual students are going to succeed in both academic and non-academic environments, as well as the adjustment of the social environment. On the contrary, people with low EC will have a high negative reactivity emotion. The possibility is that individual students become less

successful in non-academic achievement and social adjustment. Therefore, the present research aims to investigate whether the relationship between effortful and emotional control can be proven. The present research also explores students' profiles based on the level of effortful control and emotional reactivity.

METHODS

A total of 357 students of both state and private universities in Indonesia with ages ranging in 18-25 years old participate in the research, consisting of male and female. Participants are obtained by the technique of convenience sampling, which is based on the willingness of participants to follow the research. Participants are still active as a student at their respective university.

The research uses quantitative methods and correlational designs with emotional reactivity as variable I and effortful control as variable II. Data are collected through a self-report questionnaire and using Pearson correlation as statistical analysis. Data collection is done by the distribution through social media such as Facebook, WhatsApp, or Line group. Participants complete the survey data related to the data such as demographics, academic data, and problem behavior data, the short form of Adult Temperament Scale, and the short form Perth Emotional Reactivity Scale. Before doing the questionnaire distribution, the researchers do an adaptation measurement based on the guideline from the International Test Committee, in addition to measuring levels of effortful control and emotional reactivity.

The research uses the Effortful Control Scale from the short-form Adult Temperament Questionnaire (ATQ). Effortful Control (EC) is measured by the short form scale from the Adult Temperament Questionnaire/ATQ version 1,3 scale (Evans and Rothbart, 2007). The scale consists of 19 items rated by the 7-point Likert scale (1 = very not correspond with you; 7 = very appropriate to you) and is divided into the three subscales. They are inhibitory control (7 items), attentional control (5 items), and activation control (7 items). Internal scale consistency of the original full version is 0,78 (inhibitory control = 0,60, attentional control = 0,73, and activation control = 0,69) with the same value in the versions of German, French, and Japanese languages. Test-retest data reliability are only available for the Japanese (subscales ranging $r = 0,79 - 0,89$; data for the complete EC scale is not reported) and French versions (EC scale $r = 0,84$; subscales ranging $0,71 - 0,85$).

A version of the original scale of the EC is translated into the Bahasa Indonesia by English-Indonesian translators and again is assisted by two psychologists who are fluent in both English and Indonesian languages (forward translation). Then the Indonesian translation is subsequently translated back to English by Wilis Srisayekti, a professor of Psychology, who is fluent in English and Indonesian

Languages (backward translation). After the two-way translation process, content validity is performed on the measurement tool. Researchers have asked seven Psychology lecturers with clinical and educational psychology backgrounds to give their ratings. The EC reliability measurement is 0,774.

The research uses the Perth Emotional Reactivity Scale Short form (PERS-S), which consists of 20 items. PERS-S is a brief version of the original PERS, which consists of 30 items (Becerra & Campitelli, 2013; Becerra et al., 2017). PERS-S consists of 18 items to measure three aspects of emotional reactivity (activation, intensity, duration), and measure the three aspects mentioned in the context of positive and negative emotions. The PERS-S consists of six subscales, which each consists of three items; positive activation (e.g., "I tend to be very easy to feel happy"), intensity as-positive (e.g., "When I am happy, I am inclined to feel with a very deep"), Length- positive (e.g., "When I feel positive, I could remain like that for the biggest day of it"), the negative activation (e.g., "I tend to be easy to get angry"), negative intensity (e.g., "Usually, when I was not happy, I really feel that"), and negative duration (e.g., "When I get angry, I need some time to ease"). Participants respond to each item on a 5-point scale ranging from 1 (very not describing me) to 5 (very describing me). Six score subscale is separately obtained by summing the three items that are following the subscales. Therefore, the minimum and maximum for each subscale is 3 and 9. The three subscales of each valence can also be combined into a general positive reactivity scale or a general negative reactivity scale score. Scores for the general scale can range from between 9 to 45, with a much higher score represents a higher level of reactivity.

The PERS-S adaptation process is the same as that carried out on the EC measuring instrument. The emotional reactivity reliability measurement is 0,794.

RESULTS AND DISCUSSIONS

This section explains the researchers descriptive analysis of demographic data and descriptive statistical data on the level of effortful control and emotional reactivity, the correlation test between effortful control, and emotional reactivity cross-tabulation. Table 1 shows the demographics data of academic and behavior problems with 357 respondents.

According to the data in Table 1, it shows 357 participants with both females (73,7%) and males (26,3%). The number of male students in the Psychology department is less than female students. Young adult students ($N = 357$) are within 18-25 years old ($M = 20,5$, $Std. = 2,01$) According to data, the parents of participants are quite educated. Taylor et al. (2010) have stated that parents with higher levels of education are more likely to encourage their children to pursue higher education and to have the resources to support this endeavor. As such, parents' level of educational attainment is a strong and

consistent predictor of students' academic persistence as measured in early and middle adulthood. Based on academic data, participants who are accepted in the invitation pathway are 21,1%, through the national selection track 14,8%, while the independent track is 64%. Besides, 55,5% of the participants in this research have expressed that they have had their achievements in the field of academics, such as being a champion of the science olympic in the level of national, and non- academic as the dancing champion in the international level competition. Participants are active participation in students' organization, which is expressed by 54,1% of the participants. Based on the academic data, it can be concluded that the participants

in the research are relatively not having any problem in the field of academic and non-academic, although 2,8% of participants have stated that they have retaken a class before.

However, as many as 4,5% of the participants have claimed to have abused psychotropic substances, 3,4% have been involved in a brawl, 38,4% have said they had accessed a porn site, and even 6% have expressed they have issues of substance addiction. A total of 3,4% of participants have claimed they have never done free sex, 3,8% have stated they are addicted to online games, and 5% of participants have stated that they are being treated by a psychiatrist. Based on Table 1, it is obtained the characteristics of students

Table 1 Demographics Data of Academic and Behavior Problems; N = 357 Respondents

Data		Freq.	%
Gender	Male	94	26,3
	Female	263	73,7
Academic Data			
University Entrance Selection	Students achievement	75	21,1
	SNPTN National Selection	53	14,8
	Independent Test	229	64,1
Academic/Non-Academic Achievement	Yes	159	44,5
	No	198	55,5
Achievement Level	City/Regency	98	27,5
	The province	16	4,5
	National	39	10,9
	International	7	2,0
Active at Organization	Yes	193	54,1
	No	164	45,9
Data for Problem Behavior			
Drug Abuse	Yes	16	4,5
	No	341	95,5
Engage in a Gang Fight/Brawl (<i>Tawuran</i>)	Yes	12	3,4
	No	345	96,6
Opening a Porn Site	Yes	137	38,4
	No	220	61,8
	Rarely	130	36,4
Frequency	Often	24	
	Addiction	2	6
	No response the questionnaire	201	56,3
Free Sex (Ever)	Yes	12	3,4
	No	345	96,6
Has been Addicted to Online Games	Yes	85	23,8
	No	272	76,2
Currently is being treated by a Psychologist (Psychiatrist)?	Yes	18	5,0
	No	339	95

have been involved in the academic competition and those who have behavioral problems. While, Table 2 shows the emotional means of effortful control, and positive and negative reactivity.

Table 3 shows the profile of students based on effortful control and both positive and negative emotional reactivity. The number of low effortful control students is much more than high effortful control students. The present research also shows that more students have low levels of activation, effortful attention, and inhibitory control. The number of students with high general positive emotional reactivity level is much more than students with low

positive emotional reactivity. However, the number of students who have a higher level of activity is much more than the low one. Meanwhile, the number of students who have a low duration and intensity of positive emotional reactivity is lower. The number of students with low general negative emotional reactivity level is much more than students with high negative emotional reactivity. Also, the number of students who have high activation, intensity, and duration of negative emotional reactivity is much more than the low ones.

Table 4 shows that there is a significant positive relationship between effortful control and

Table 2 The Emotional Means of Effortful Control, and Positive and Negative Reactivity

Descriptive Statistics			
	N	Mean	Std. Dev
Effortful Control	357	84,03	12,2
Activation	357	32,06	5,69
Attention	357	19,97	4,83
Inhibitory	357	32	6,51
General Positive Reactivity	357	34,4	5,31
Positive_Activation	357	12,24	2,03
Positive_Intensity	357	11,49	1,99
Positive_Duration	357	10,67	2,29
General Negative Reactivity	357	28,44	7,24
Negative_Activation	357	9,87	2,7
Negative_Intensity	357	9,44	2,78
Negative_Duration	357	9,12	2,78

Table 3 Profile of Students based on Level Effortful Control and Reactivity Emotions

	Level			
	High		Low	
	Freq.	%	Freq.	%
Effortful Control	183	45,7	194	54,3
Activation	159	44,5	198	55,5
Attention	158	44,5	199	55,5
Inhibition	169	47,3	188	52,7
Emotional Reactivity				
General Positive Reactivity	189	52,9	168	43,7
Activation	172	48,2	185	51,8
Intensity	195	54,6	162	45,4
Duration	138	38,7	219	61,3
General Negative Reactivity	176	40,3	181	50,7
Activation	143	40,1	214	59,9
Intensity	176	49,3	181	50,7
Duration	165	46,2	192	53,8

positive emotional reactivity ($r = 0,011$, $p \leq 0,05$). It means that the students who have high levels of effortful control also have a high positively emotional reactivity, and vice versa, the students with lower effortful control also have a low positive emotional reactivity. However, the relationship between effortful control and positive emotional reactivity is very weak. There is a relationship between effortful control and positive emotional reactivity. However, this does not necessarily mean that positive emotional reactivity causes effortful control to change directly, and vice versa.

Table 5 shows a significant relationship between effortful control and negative emotional reactivity negatively ($r = -0,208$, $p \leq 0,01$). It means that the students who have high effortful control are having low negative emotional reactivity, and vice versa. An individual student who has a low level of effortful control means that this student has high emotional reactivity. However, the relationship between effortful control and reactivity of negative emotions is relatively low.

Since the researchers find there is a positive significant relationship between effortful control with positive emotional reactivity, and there is a negative significant relationship between effortful control and negative emotional reactivity, the researchers want to examine the numbers of both low and high effortful

control students with both positive and negative emotional reactivity levels. Therefore, as an addition to descriptive analysis, cross-tabulation is carried out between effortful control and emotional reactivity.

Table 6 shows that 70 students in the low effortful control level are grouped into low positive emotional reactivity category, and 59 students are grouped into high positive emotional reactivity. It can be concluded that the low effortful control students group, in general, is having low positive emotional reactivity. From Table 6, it can be seen that of the high effortful control level, 34 students are grouped into low positive emotional reactivity category, and 48 students are grouped into high positive emotional reactivity. It can be concluded that the high effortful control students group, in general, is high positive emotional reactivity.

According to Table 7, it can be seen that 63 students in the low effortful control level are grouped into low positive emotional reactivity category, and 66 students are grouped into high positive emotional reactivity. It can be concluded that the low effortful control students group, in general, has high negative emotional reactivity. From Table 7, it can be seen that 44 high effortful control level students are grouped into low negative emotional reactivity category, and 38 students are grouped into high negative emotional reactivity. It can be concluded that the high effortful

Table 4 The Correlation of Effortful Control & Positive Reactivity

		Correlation	
		Erpositive	EC
Erpositive	Correlation Coefficient	1.000	0,110*
	Sig. (2-tailed)		0,038
	N	357	357
EC	Correlation Coefficient	0,110*	1,000
	Sig. (2-tailed)	0,038	
	N	357	357

* Correlation is significant at the 0,05 level (2-tailed).

Table 5 The Correlation of Effortful Control & Negative Reactivity

		Correlation	
		Ernegative	EC
Ernegative	Pearson Correlation	1	-0,208**
	Sig. (2-tailed)		0,000
	N	357	357
EC	Pearson Correlation	-0,208**	1
	Sig. (2-tailed)	0,000	
	N	357	357

** Correlation is significant at the 0,01 level (2-tailed)

control students group, in general, has low negative emotional reactivity.

Effortful control is an individual's ability to think and control feelings in the face of an event and becomes the basis for individuals to decide on a choice of behavior that will be done with consideration. This ability can direct individuals to behave. Posner and Rothbart (2007) have stated that the attentional processes involved in effortful control (i.e., executive attention) develop later than the posterior attentional system. Executive attention is viewed as involved in not only the abilities to willfully focus and shift attention as needed to adapt, but also in inhibitory control and activation control (i.e. the abilities to

inhibit or activate behavior as needed, especially when one is not inclined to do so). The research shows that students tend to have low attention than the other subscales of effortful control (activation and inhibitory control). The students with low attention might tend to be easily distracted with emotional events.

Effortful control plays an important role in the self-regulation of emotional experiences and processes. Emotional is an individual's response to emotional situations, both positive and negative emotions. Reactivity emotions have three aspects response to emotion; they are activation, intensity, and duration (Becerra & Campitelli, 2013). There is a close and reciprocal forth relationship between the

Tabel 6 Effortful Control & Positive Emotional Reactivity Cross-tabulation

EC & Positive Emotional Reactivity Cross-tabulation						
			Positive Emotional Reactivity		Total	
			Low	High		
EC	Low	Count	70	59	129	
		% within EC	54,30%	45,70%	#####	
		% within Pers_P	67,30%	55,10%	61,10%	
		% of Total	33,20%	28,00%	61,10%	
		High	Count	34	48	82
			% within EC	41,50%	58,50%	#####
	% within Pers_P		32,70%	44,90%	38,90%	
	Total	Count	104	107	211	
		% within EC	49,30%	50,70%	#####	
		% within Pers_P	100,00%	100,00%	100,00%	
		% of Total	49,30%	50,70%	#####	

Table 7 Effortful Control & Negative Emotional Reactivity Cross-tabulation

EC & Negative Emotional Reactivity Cross-tabulation						
			Negative Emotional Reactivity		Total	
			Low	High		
a	Low	Count	63	66	129	
		% within EC	48,80%	51,20%	100,00%	
		% within Pers_N		63,50%	61,10%	
		% of Total	29,90%	31,30%	61,10%	
		High	Count	44	38	82
			% within EC	53,70%	46,30%	100,00%
	% within Pers_N		41,10%	36,50%	38,90%	
	Total	Count	107	104	211	
		% within EC	50,70%	49,30%	100,00%	
		% within Pers_N	100,00%	100,00%	100,00%	
		% of Total	50,70%	49,30%	100,00%	

reactivity of the emotion, and the ability to regulate emotions is effective. More intense reactions tend to be more difficult to be regulated and controlled. In the case of unpleasant emotions or negative emotions, poorer regulatory skills tend to contribute to more intense and persistent emotional responses (Gross, Sheppes, & Urry, 2011; Gross & Jazaieri, 2014).

Effortful control and reactivity are components of temperament. Temperament is conceptually different in individuals who are relatively stable. The difference in individuals is also seen in the profile of participants based on the level of EC and emotional reactivity. The participants of this research consist of students who have a high EC level (45,7%) and a low EC level (54,3%). According to the correlations test, it can be stated that students who have a high effortful control level have a high positive reactivity emotions level.

The level of negative emotional reactivity is higher, while the level of positive emotional reactivity is lower. It is measured by PERS, which is significantly associated with depression, anxiety, and symptoms of stress, and the difficulty of regulating emotion. PERS composite general negative reactivity also correlates strongly with scores from other self-reported negative reactivity measurements (Nock et al., 2008).

Emotional reactivity is a core part of the emotional experience (Gross, Sheppes, & Urry, 2011) and, like regulation, also appears to be a key construct for understanding psychopathology (Rottenberg & Johnson, 2007). Problematic levels of emotional reactivity have, for example, been implicated in the development and maintenance of a range of mental disorders, including depression (Bylsma, Morris, & Rottenberg, 2008). However, the research shows that students with negative emotional reactivity might not tend to be implicated in mental disorders.

CONCLUSIONS

Finally, the research reveals that there is a positive significant relationship between effortful control and positive emotional reactivity. However, the research shows that there is also a negative significant relationship between effortful control and negative emotional reactivity. The research states that students with high levels of effortful control have high positive emotional reactivity; likewise, students who have low levels of effortful control have low positive emotional reactivity. However, individuals who have a high level of effortful control have low negative emotional reactivity and vice versa.

In conclusion, the research provides the necessary first step toward clarifying the specific intrapersonal problem profiles associated with varying levels of EC in nonclinical young adults. Individuals who are low in EC have reported that they might have personal problems with high levels of negative emotional reactivity. However, individuals with high EC have reported that they had low negative

emotional reactivity. These findings suggest that high EC might buffer against the risk of maladjustment. Overall, these findings also suggest that EC skills and emotional regulation skills might play an important role in shaping young adults' intrapersonal functioning and in promoting social adjustment.

The research is limited by its reliance on self-reported data as well as the cross-sectional nature of the assessments. Future studies should include informant ratings and longitudinal assessments of intrapersonal functioning. The gender composition in the research's sample is mostly female (73,7%); however, the gender distribution reflects a typical undergraduate psychology research population. Further, this sample is composed entirely of undergraduate students. Future researches should include community samples of young adults to improve generalizability. Finally, the research suggests that EC protects against developing intrapersonal distress, but it not include direct measures of psychopathology. Also, future researches should employ more direct measures of symptoms to clarify the link among EC, intrapersonal problems, maladjustment, and student achievement in early adulthood.

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