

## **Self-regulation, behavioral activation system, and its role in predicting academic distinguished performance among superior students at the University of Hail**

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### **Abstract**

The study was prepared for identifying whether the skill of self-regulation and the behavioral activation system had a role in predicting academic distinguished performance and identifying the differences among students according to the dimensions of self-regulation.

The descriptive correlative method was followed. The sample was chosen randomly, and amounted to 156 academically superior students, from the humanities and medical specialties.

The Revised Reinforcement Sensitivity Scale (rRST-Q) measured the behavioral activation system, and using Shortened Self-Regulation Scale (SSRQ), the tools were translated into Arabic by the researcher.

The result showed that there is a positive statistical relationship between self-regulation (SR), behavioral activation system (BAS), and grade point average (GPA).

The (BAS), and (SR); Predict the (GPA). Moreover, students in the first and second rank have similar skills in most self-regulation dimensions, while the second rank has higher Receiving relevant information, and the first rank has higher Assessing the plan's effectiveness.

**Keywords:** Self-regulation, behavioral activation system, grade point average, academic distinguished performance, academically superior students.

## Review of literature

University education is at the top of the educational ladder, and university students experience in their university life various circumstances, pressures, and academic, social, and psychological challenges, so it is important to highlight skills that will improve academic performance because it is one of the biggest challenges facing students.

Now, education is concerned with providing students with self-regulation skills due to its great role in improving the educational process and academic achievement (Sahranavard et al., 2018).

It is a crucial component of human performance that aids in the efficient pursuit of individual objectives (Inzlicht et al.,2020).

The enjoyment of self-regulation by members of society is positively reflected in various areas of health, social, professional and other life (Moffitt et al., 2011).

The skill of self-regulation is referred to as academic self-regulation, in addition to any processes that allow individuals to activate cognitive skills such as perception, as well as emotional and behavioral skills, while maintaining this level to ensure the achievement of learning goals (Schunk & Zimmerman, 1994).

SR can be described as a system of teachable skills (Duckworth et al., 2016). Through which an individual directs his behavior towards desired goals cognitively, emotionally, and behaviorally (Gross, 2015).

Objectives can be reached through several activities such as setting goals, planning to achieve them, working to implement them, and creating the conditions for achieving them (Ludwig et al., 2019).

Self-regulation may be seen of as an umbrella phrase that covers a variety of goal-related actions, including choosing which objective to pursue, preparing

how to do so, putting these plans into action, safeguarding goals from conflicting interests, and occasionally giving up on goals (Inzlicht et al.,2020). Many theories explain self-regulation through two main systems, the impulsive system, and the control system.

The impulsive system can be described as spontaneous short-term gratification, in which rapid responses to the environment occur, especially to temptations and stimuli of high value (Hofmann et al., 2009).

Moreover, this system is characterized by activity; Neurologically, it is associated with some brain regions responsible for reward and emotion, such as the nucleus accumbens in the ventral striatum, and the amygdala, insula, (Lopez et al., 2014;Heatherton & Wagner ,2011).

As for the control system, it is slow in which alternatives and options are most appropriate for responses.

It is also characterized by being in charge of more sophisticated brain processes, such as setting goals, defining strategies to achieve them, in addition to evaluating these goals and plans (Hofmann et al., 2009).

This system differs from the impulsive system in that it controls stimuli, and is affected by long-term goals, although it deals with flexibility with environmental variables(Cowan, 2001).

Berkman and colleagues reported (2011) that making decisions and judging things, it is neurologically related to the lateral prefrontal cortex.

Human behavior is produced through the interaction between these two systems, which may be mutually supportive or opposing according to different situations (Inzlicht et al., 2020).

Here arises the issue of self-control in which the control system may overcome the impulsive system (Lopez et al., 2017).

Several factors also interfere in the functioning of these two systems such as individual differences, impulse control, fatigue, stress, high or low mood,

substance use, in addition to organic problems such as brain damage (Heatherton & Wagner,2011; Carver, 2005).

Conceived by Miller and Brown (1991) Self-regulation includes seven stages: receiving relevant information, evaluating the information and comparing it with standards, making change, searching for options, formulating the plan, implementing the plan, and evaluating the effectiveness of the plan (Yeow & Martin,2013).

In general, the SR and SRL models discussed above illustrate the hypothesis that people are active and have the ability to form their own opinions, and to monitor and modify their actions and thoughts.

Everyone has a value system by which he can set his goals and standards and evaluate progress and achievement.

Finally, self-regulation is influenced by the cultural aspect of individuals and also plays an important role in the individual's perception, motivations and behaviors that lead to the achievement of his goals (Chen & Lin, 2018;Pintrich,2000; Boekaerts & Corno, 2005).

The behavioral activation system is a component of Gray's Reinforcement Sensitivity Theory (RST), which refers to three behavioral systems of the brain, and makes up Individual variations in reward sensitivity, punishment, and stimulation. It has been used to study and predict anxiety, impulsivity, and extroversion (Gray, 2003).

The theory (RST) evolved from Gray's theory of the psychobiology of personality, incorporating findings from a number of fields in psychology and neuroscience, which was revised in 2000 and the theory emerged in a new and revised form (Corr,2004).

The behavioral activation system (BAS) is associated with adaptation to reward-related stimuli and avoidance of all negative consequences (Franken et al., 2005).

BAS is associated with the medial limbic dopamine pathways (Pickering,2001).

People whose brains produce more dopamine than others can be described as having energy, a desire to explore, and more motivated than others for rewards (Leyton,2002).

Through this study, the researcher seeks to identify the relationship between self-regulation, the behavioral activation system, and the grade point average among academically superior female students.

In addition to identifying whether students are self-organizing, and checking the differences between female students in the dimensions of self-organization according to the academic distinguished rank.

### **The Study Problem**

Superior students are those noted for outperforming their counterparts in numerous disciplines, particularly intellectual ones.

Furthermore, there are other challenges associated with academic brilliance, such as social and emotional concerns (Pacheco et al., 2017).

On the other hand, participating in activities in a collegiate context needs the ability to self-regulate by avoiding harmful behaviors while arranging behavior effectively in pursuit of academic and career-related rewards (Soltis et al.2018).

From the perspective of studies conducted on students in general and superior students in particular, the researcher found a question that needs to be answered through the scientific method; Is self-regulation and behavioral activation system can predict the academic performance of superior students at the university?

## **Study hypothesis**

Through this study, the researcher seeks to verify the following hypotheses

- 1-The academically superior students are characterized by the skills of self-regulation and behavioral activation, with a statistically significant degree at a significance level ( $\alpha \leq 0.05$ ).
- 2-Is there a correlation between the cumulative average, self-regulation and the behavioral activation system with a statistically significant degree at a significance level ( $\alpha \leq 0.05$ ).
- 3-There are statistically significant differences in the dimensions of self-regulation according to the distinguished academic rank, at the level of ( $\alpha \leq 0.05$ ).

## **Study Objectives**

The study aims to:

- 1- Recognizing the extent to which superior students have the skills of self-regulation and the behavioral activation system.
- 2- To verify the existence of a correlation between the students's grade point average, self-regulation skills, and the behavioral activation system.
- 3- Ensure that there are differences between superior students in self-regulation skills according to the distinguished academic rank.

## **The importance of the study**

The importance of this study is to put on light on the issues of academic excellence. Hoped also it is the results of the research will be useful in improving training, and counseling programs, which would improve students' skills. Moreover, the research discusses the behavioral activation system in the field of education after it has been used for a long time in the mental health field only.

## **2. Materials and Methods**

### **2.1. Method:**

The researcher used the descriptive-correlational approach for its relevance to the study problem and its hypotheses .

### **2.2. Participants:**

Data was collected anonymously via an online questionnaire; a promotional message outlining the study's goal and providing a link to the online survey site was provided. Reminders were sent to students to encourage them to participate in the study.

The study sample consisted of 162 students, six of whom were excluded for lack of completeness of data, so the final number became 156, and they were divided into two groups according to academic specialization.

The number of female students in the field of human sciences (n = 66) and medical students (n = 90), The participants were between the ages of 17 and 25. Female students' GPAs ranged from 1 to 4 points, data were collected from November to December 2020.

### **2.3. Instruments:**

#### **2.3.1. General data questionnaires**

Sample members completed three online questionnaires. The first part deals with personal data such as (specialty, GBA).

See table (1).

**Table 1**  
**Personal data of the sample members**

Variables		N	%
specialty	human	66	42.3%
	medical	90	57.7%
	<b>total</b>	<b>156</b>	<b>100%</b>
GBA	3 to 3.49	48	30.7%
	3.5 to 3.74	70	44.9%
	>3.75	38	24.4%
	<b>total</b>	<b>156</b>	<b>100%</b>

### 3.2.2. Short Self-Regulation Questionnaire (SSRQ):

The Self-Regulation Questionnaire (SSRQ) Short Version is a 31-item self-report measure of the ability to regulate behavior to accomplish one's objectives.

The scale elements are divided into seven dimensions: Obtaining pertinent information when evaluating data and evaluating it against norms, Bringing about change, while looking for alternatives, creating a strategy, putting the strategy into action evaluating the plan's efficacy.

Using a 5-point Liker scale, participants rate how much they agree with each item: 1 (never), 2 (rarely), 3 (Sometimes), 4 (Often), and 5 (Always). Score from 1 to 5, with a breakpoint of 3.

The Pearson correlation coefficient was employed to check the integrity of the paragraphs' internal consistency in order to ensure their validity.

The results of this process showed that all paragraphs were saturated and that they were statistically significant.

At a significance level of 0.01 significance, the correlation coefficient for the



items ranged from (.460) to (.746).

The score for dependability was 0.96. As a result, all of the scale paragraphs are internally consistent, demonstrating the items' validity.

As a result, this scale is appropriate for conducting the research.

Cronbach's Alpha was used to determine the scale's reliability, and the total reliability degree was (.92), this shows that the scale has a high degree of stability and can be trusted in this research.

## **2.4. Statistical analysis:**

Parametric tests were used for the analysis. Correlations between variables were tested using the Pearson correlation test coefficient.

Intergroup comparisons were made using the one-way analysis of variance (ANOVA) to compare categorical variables.

To discover the predictive value of different variables, an incremental multiple linear regression was used.

Spearman-Brown Coefficient, Cronbach's Alpha, and Guttman split-half Coefficient were used to validate the validity of the tools' study.

All computations were done using SPSS for Windows v24 (IBM Corporation, Armonk, New York) on Windows 10 / PC.

## **3. Results**

### **3.1. General characteristics of the superior students**

To answer the question of whether the academically superior students are characterized by self-regulation and behavioral activation system; the researcher used a one-sample t-test.

Table (2) showed the results that the students were self-regulating,  $t(155) = 44.2$ ,  $p = .000$ . They also have a behavioral activation system,  $t(155) = 40.0$ ,  $p = .000$ .

**Table (2)**  
**General characteristics of the sample members:**

Variables	t	df	P	Mean	S.D
self-regulation	44.20	155	.000	116.1	11.1
Behavioral activation system	40.0	155	.000	32.26	4.18

### 3.2. The Correlation between GPA, self-regulation, and the behavioral activation system

The Pearson Correlation coefficient was use to check a statistically significant correlation between GPA, self-regulation and the behavioral activation system. The researcher tested the correlation between the three variables and it was discovered that there is a positive correlation with one another. Self-regulation ( $r = 0.400$ ,  $P = .000$ ,  $P < .001$ ). BAS ( $r = 0.350$ ,  $P = .000$ ,  $P < .001$ ). shows that in Table (3).

**Table (3)**  
**Correlation between GPA, self-regulation, and BAS**

Variable	self-regulation	BAS
GBA	Pearson's r	0.400***
	p-value	< .001
	Pearson's r	0.442***
	p-value	< .001

The researcher used multiple regression standard, to know whether it is possible to predict GBA through self-regulation and the behavioral activation

system.

The regression results indicated that it could be predicted that .

125% of the variance was due to self-regulation, ( $R^2=.135$ ,  $F=23.3$ ,  $p<.01$ ).

It was found that significantly predicted ( $\beta = .400$ ,  $p<.001$ ), While (BAS) revealed that the predictor variable explained .

195%, the variance in the outcome variable with, ( $R^2 =.195$ ,  $F=18.5$ ,  $p<.001$ ).

The finding revealed that (BAS) positively predicted ( $\beta = .442$ ,  $p<.001$ ).

As shown in Table (4).

**Table (4)**  
**Linear Regression for self-regulation, and BAS**

Variable	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	Beta	P
self-regulation	0.400	0.135	0.125	23.3	.400	< .001
BAS	0.442	0.195	0.185	18.551	.442	< .001

### 3.3. Differences in the dimensions of self-regulation according of academic Distinguished rank:

To identify the differences in the dimensions of self-regulation according to the academic distinguished rank variable, the One-way ANOVA test was used.

Table (5), showing the statistical differences in the self-regulation; Evaluating the information, Receiving relevant information, Searching for options, Triggering change, and Assessing the plan's effectiveness, Also, there are no differences in Formulating a plan, and Implementing the plan.

Table (5)

Differences in the dimensions of self-regulation according of academic Distinguished rank

dimensions of self-regulation		Sum of Squares	df	Mean Square	F	Sig.
Receiving relevant information	Between Groups	143.6	3	47.9	8.450	.000
	Within Groups	2038	1	2038		
	<b>Total</b>	2181.6	152			
Evaluating the information	Between Groups	58.5	3	19.5	3.15	.027
	Within Groups	20263	1	20263		
	<b>Total</b>	20321.5	152			
Triggering change	Between Groups	42.75	3	14.25	4.26	.006
	Within Groups	12023	1	12023		
	<b>Total</b>	12065.8	152			
Searching for options	Between Groups	20.1	3	6.7	3.1	.029
	Within Groups	1884	1	1884		
	<b>Total</b>	1904.1	152			
Formulating a plan	Between Groups	45.6	3	15.3	1.4	.248
	Within Groups	21205	1	21205		
	<b>Total</b>	21250.6	152			
Implementing the plan	Between Groups	4.2	3	1.37	.104	.95
	Within Groups	24189	1	24189		
	<b>Total</b>	24193.2	152			
Assessing the plan's effectiveness	Between Groups	144.1	3	48.1	16.22	.000
	Within Groups	19714	1	19714	8.450	
	<b>Total</b>	19858.1	152	47.9		

The differences in Receiving information according to Distinguished Rank, the differences were in favor of the 2nd Rank, the (M = 20.0, ±.00) [F(3,1) = 8.450, P=.000].

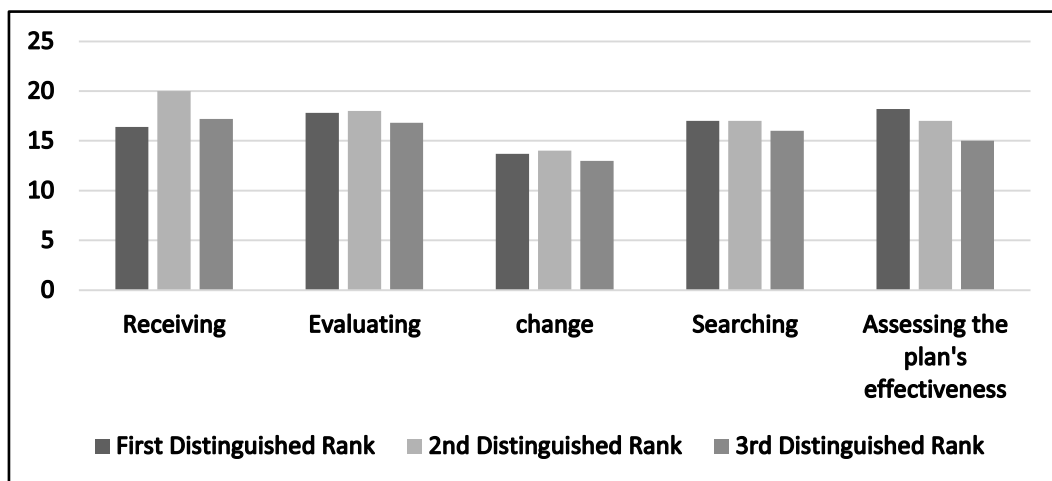
Although they are differences in Evaluating the information The result showed the differences in favor of 2nd Rank; the (M = 18.0, ±.00) ,and there are minor differences with the first rank; (M = 17.75, ±2.1) , [F(3,1) = 3.15, P=.027]. Triggering change, The differences are for the 2nd Rank, (M = 14.0, ±.00), [F(1,3) = 4.26, P=.006]. In Searching for options, The differences are for the first Rank, (M = 17.0, ±.1.6), [F(1,3) = 3.1, P=.029].

In addition, there are differences in the Assessing the plan's effectiveness, in favor of the first rank, (M = 18.12, ±.1.37), [F(1,3) = 16.22, P=.000]. See Figure (1)

Figure 1.

Differences in the dimensions of self-regulation according of academic distinguished rank.

#### 4. Discussion



The results of the research showed that students who excel academically are characterized by self-regulation and behavioral activation, and that these skills are positively associated with an increase in academic average and predict academic excellence. This result is consistent with the results of the study of

Sahranavard "et al." (2018) which indicated the association of self-regulation with higher academic performance.

That (SR) if it is effective becomes a basis for positive behavior during the semester, which leads to achievement (Ladd et al., 1999). Therefore, goal-oriented SR leads to better academic performance (Wang et al., 2021).

(BAS) is positively related to academic performance (van Beek et al., 2013). Moreover, Franken (2005) indicates that the behavioral activation system motivates individuals to work towards achieving goals that may lead to positive outcomes. People with BAS tend to be rewarded rather than punished, so they work in an organized and earnest way to be able to achieve their goals, and they experience positive emotions such as hope and elation (Carver,1994). Which is well in line with target selection, resource allocation, and self-regulating executive performance (Gestsdottir,2008).

Indicated Mohsen Pour "et al." (2006) that students who used various (SR) strategies were able to successfully plan for the future, and showed high self-efficacy. Also, their academic performance is related to managing their emotions, motivating them to study, and planning goals (Sayah et al., 2013). The (SR) is the most effective component of Zimmerman's academic success (Hartley, 2008; Bendixen, 2001).

Students who have a high degree of it are emotionally and cognitively stimulating consistent behavior in the educational environment (Zimmerman, 1990). Moreover, they have self-directedness and specific strategies for acquiring the knowledge and skills needed to learn. They not only receive guidance, but also formulate their own strategies that help them excel (Nota & Soresi, 2000; Zimmerman,1998) (SR) also has an impact on well-being and academic performance (Wang et al., 2021).

They report low levels of stress, emotional exhaustion, low mood, and fatigue (Firoozabadi et al., 2018; Park et al., 2012).

The key characteristic of self-regulating students is independence, which helps to set achievable goals, define actions, and use knowledge of surrounding circumstances to ensure that the most appropriate decisions are made. (Miller & Byrnes, 2000).

The results of the study showed that outstanding students differ in the dimensions of self-regulation; the most important characteristic of the second rank of excellence is receiving relevant information, while the first rank of excellence has a high ability to evaluate the effectiveness of plans, and the third rank of excellence is the lowest in all skills. Zapata and his colleagues (2014) explained that the informational input is the first thing that occurs in self-regulation, through which the individual obtains information, increases his understanding of the nature and impact of behavior, and learns about his current behavior and what may be problem behavior. As for evaluating the effectiveness of plans, a comparison is made between actual and expected performance, and it recognizes the negative consequences that this gap may cause. It uses internal and external criteria such as social norms and environmental conditions in general to evaluate them.

It was also noted that the majority of outstanding female students in various ranks of academic excellence present a similar level in formulating and implementing plans. The female students in the first place are distinguished from the rest in that they have a high ability to evaluate the effectiveness of the plans they have implemented.

The result of the study agrees with the result of Al-Wattban (2014) (in Arabic) study which was shown that students who have higher skills in observation and control report a higher level of academic performance.

The study (Pjares, 1996) also indicated those increasing students' ability to monitor the learning process accurately, as well as increasing their ability to estimate the level of their progress in that educational task, and also increasing their ability to notice mistakes that occur during the learning process, and increase their capabilities To bypass and correct these errors.

The formulation of the plan includes defining the timetable and the activities to be implemented that contribute to achieving the goals, whether they are reducing non-consensual behavior or acquiring behaviors that are more positive. As for plans, predetermined activities are implemented, which require more self-control, resistance to temptations, and self-motivation.

The final stage is addressed through a comprehensive evaluation, dealing with both the effectiveness of planning and the achievement of goals (Zapata et al.,2014).

Moreover, they become able to learn from the mistakes they made and think about what happened in depth, enabling them to discover mistakes and make decisions, while finding alternatives and solutions deriving from their knowledge of the results of the plans that have been implemented (Gavora et al., 2015).

Self-regulating students have a higher ability to evaluate events and plan positively, which makes them less defensive and have fewer cognitive distortions, so their evaluation becomes more (Scheuer & Epstein, 1997).

Moreover, the use of goal-directed, metacognitive, and self-evaluation strategies contribute to psychological well-being and increases goal achievement (Travis and Bunde, 2020).

Self-evaluation of the learning process refers to ascertaining the extent to which predetermined goals have been achieved, and comparing the achieved results with Preset goals (Zimmerman, 2000).

From the researcher's point of view that both self-regulation and the behavioral activation system are involved in the brain regions responsible for reward and emotion, so the high achievers find pleasure in the learning process, and the neural circuits contribute to their sense of happiness resulting from achievement related to academic performance.

The differentiation among female students in the rank of excellence is due to the importance that students attach to each skill.

The students in the second rank of distinction seek more than others, to receive information, thinking that it contributes to increasing their achievement, without verifying the effectiveness of the plans they implemented based on this information.

While the female students in the first rank of excellence reached this stage because of their high ability to evaluate the plans they implemented and correct the mistakes they made, which made them take the best ways that lead them to academic excellence.



## 5. Implications

Based on the statistical results of this study, the researcher believes that there are Implications for his study from a theoretical and applied point of view. Addressing the theory of Reinforcement Sensitivity outside the context of mental disorders, especially anxiety, opens the horizons for researchers to benefit from and develop them by conducting more studies on people in the community outside psychiatric clinics, to The aspect of applying the concept of theory in developing capabilities and achieving psychological well-being for individuals.

Moreover, academically superior students fall under a lot of pressures that may limit their excellence if they are not able to manage their daily lives and use self-regulation skills efficiently. The result of the study showed that the skill that distinguishes high achievers who have a first degree of excellence from others; It is the ability to evaluate the plans that have been implemented, which gives them a greater opportunity than others to correct mistakes and benefit from them in developing performance and maintaining excellence.

Therefore, the concerned teachers and policy-makers should benefit from the results and tools of this study, pay attention to measuring self-regulation skills, and Reinforcement Sensitivity system among students, and provide appropriate training programs for each student according to his needs to achieve psychological well-being and academic excellence.

## 6. Conclusion

The study concluded that both self-regulation and the behavioral activation system are positively related to the GPA of female students, in addition, they predict a high GPA. The first ranked students; have a high ability to evaluate the effectiveness of the plan they are implementing, and this may be the most prominent difference between the academically superior students.

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## **Declaration of Conflicting Interests**

The author acknowledged no possible conflicts of interest in connection with this article's research, writing, and/or publishing.

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