

# Overexcitability and its Impact on Psychosomatic Disorders and the Role of "Cognitive Emotion Regulation" as a Mediating Variable

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## Research Article

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# Abstract

## Background

The current investigation examines TPD's assumption that bright people are overexcitable. The study will also reveal the impact of overexcitability on the degree of psychosomatic disorders among individuals regardless of talent. It was to examine what was assumed by the theory concerning the "amplified neurotic singularity" for the overexcitability and the possibility of improving their ability to be affected by psychological and physical orally. The study will also examine the "indirect influence" of positive and negative Cognitive Emotion Regulation as two mediating variables that control the effect of overexcitability on psychosomatic diseases.

## Methodology

The descriptive analytical approach was utilized to test the study's assumptions using the Overexcitability Questionnaire II (OEQII), Cognitive Emotion Regulation Questionnaire (CERQ), and Patient Health Questionnaire PHQ-15 somatization on a sample of 269 students (male and female) (204 female).

## Results

The study found that talented and normal pupils differed mainly in intellectual overexcitability ( $p=.044$ ,  $2.021T=$ ). Track analysis demonstrated that emotional overexcitability and imaginative arousal have "direct favorable impacts" on psychosomatic diseases.  $P= 0.007$ -  $Z=2.681$ .  $Z=4.929$  -  $P<.001$ . "Direct positive impacts" are for sensory and intellectual forms, negative effect on positive emotional regulation, direct negative effect for imaginational overexcitability, and positive effect of emotional overexcitability on negative emotional regulation.

## Conclusions

Positive and negative emotional regulation as mediators showed no indirect connections between overexcitability and psychosomatic diseases. Considering the results, the study proposes future research on the effect of normal overexcitability on other psychological diseases and characteristics like attachment, social competence, and flexibility.

## Introduction

The Theory of Positive Disintegration (TDP) was conceived as a result of Dabrowski's observations and interactions with brilliant writers, artists, religious academics, and youngsters (Jackson & et al., 2009). He assumed these brilliant individuals possess some personal qualities that contribute to their uniqueness. Overexcitability was regarded as one of their particular features based on the unique qualities of their neurological system. The term "overexcitability" denotes the inherent predisposition to respond with the delicate sensitivity and intense focus to internal and external stimuli. (Piechowski,1999, 2013).

Based on the preceding, numerous studies on overexcitability have concentrated on gifted and talented individuals. Despite Piechowski & Wells's (2021) assertion, not all gifted and talented individuals must exhibit overexcitability according to the concept assumed by Dabrowski in his thesis. Let's examine the results of past research. We discover that they do not correspond to the nature of the difference between gifted and average students, on the one hand, and especially regular students, on the other, despite the different methodologies. Research conducted on children and adolescents before college enrollment found that gifted pupils received distinctions in practically every category (approved to specify them on the previously codified measurements for intelligence). (Harrison & Haneghan, 2011; Broeck et al., 2014; Algadheeb, 2020; Limont et al., 2014).

However, research conducted on individuals during their undergraduate and post-university years found that their distinctiveness is limited to intellectual overexcitement (AlSulaiman, 2016; Wirthwein et al., 2011; Nordin, 2007). However, Wirthwein et al. (2011) and Nordin (2007) researched younger pupils in German and American societies. It was discovered that they relied on IQ scales to identify the gifted. The study by AlSulaiman (2016) was conducted in Saudi society. It identified gifted students based solely on the standard of academic excellence measured by their GPA, increasing the need to ensure this result by relying on other scales for non-GPA academic excellence in Saudi society.

Based on the TPD theory, overexcitability is one of the personal traits of the gifted. It does not withstand Piechowski & Wells's (2021) assertion that not all gifted and talented individuals are characterized by overexcitability. The comparison between regular and talented students, who are adults and in the university, and post-university stages, did not demonstrate the superiority of gifted students, save in the case of intellectual overexcitement, as noted previously. Because absolute zero does not exist in this scenario, it is reasonable to conclude that overexcitability is one of the standards (students') personal traits. It is also probable that varying degrees affect an individual's adaptability and quality of life. However, most past research has only examined it in samples of gifted and talented (students) or the context of a comparison between them and average pupils (students).

Dabrowski hypothesized that one of the features of overexcitability was the transfer of emotional experience to the "parasympathetic nervous system." It renders a person more susceptible to rapid heartbeat, facial flushing, tremors, perspiration, and headaches (Piechowski, 1999, 2013)

This shows that this overexcitability may affect a person's psychosomatic disorder symptoms as a negative consequence of the sensitivity of this overexcitability. Except for the study of Harrison & Haneghan (2011), which discovered a correlation between overexcitability and sleeplessness, the researcher could not uncover any studies that directly confirm this effect. Alternatively, if overexcitability is one of the personal characteristics that may affect a person's suffering from psychosomatic disorders (regardless of giftedness and talent), do cognitive factors that manage a person's emotions have a role in modifying this effect, either by increasing or decreasing it? In other words, can "Cognitive Emotion Regulation" mediate between overexcitability and psychosomatic diseases to modify their effect? This study will attempt to confirm these hypotheses and respond to these questions.

# Study Problem:

The need for the present study stems from the need to confirm the difference between the average and the gifted in Saudi culture and to do so by identifying the gifted using various measures (non-GPA academic). Numerous studies have addressed the topic of overexcitability as a hallmark of the brilliant and gifted, even though it can be viewed as a personal trait that can be found in the normal population in variable degrees because there is no absolute zero for personal traits. The increasing percentage of intellect among gifted individuals does not imply that non-gifted or average individuals have no intelligence. Varied cognitive levels have different effects on the individual. This served as motivation to investigate the impact of various forms on the lives of an individual, regardless of his aptitude.

On the other hand, the theory's assumption regarding the physiological functions of those with overexcitability revealed that it resulted from disintegration and disorder (Piechowski, 1999, 2013). It raises questions regarding the effect of overexcitability on psychosomatic disorders as a physical disorders resulting from emotional disorders. Due to the scarcity of research that has addressed this element, the need to answer this topic increased. In addition, the current research aims to examine the role of cognitive aspects as moderating mechanisms that can alter the influence of forms of overexcitability on psychosomatic diseases. Consequently, the study will attempt to address the following issues: What are the differences between the gifted (students) and normal (students) in the five forms of overexcitability (Psychomotor, Sensual, Intellectual, Imaginational, and Emotional)?

1) What are the direct effects of five forms of overexcitability (Psychomotor, Sensual, Intellectual, Imaginational, and Emotional) on adaptive emotion regulation, negative emotion regulation, and psychosomatic disorders?

2) What are the indirect effects of overexcitability on psychosomatic disorders through adaptive and negative emotion regulation variables?

# Study Hypotheses:

The following null hypotheses were tested at the 0.05 level of significance:

1) No differences were found between the gifted (students) and normal (students) in the five forms of overexcitability (Psychomotor, Sensual, Intellectual, Imaginational, and Emotional).

2) H02- (PM OE, S OE, IM OE, I OE, E OE) does not directly affect PHQ-15, P CER, and N CER in university students.

3) H03- (PM OE, S OE, IM OE, I OE, E OE) does not have an indirect effect on PHQ-15 in students at the university through its influence on P CER.

4) H04- (PM OE, S OE, IM OE, I OE, E OE) does not have an indirect effect on PHQ-15 in students at the university through its influence on N CER

The current model represents direct and indirect effects between the study variables. (Fig. 1).

## Literature Review

### Overexcitability

The concept of overexcitability is regarded as one of Dabrowski's most important contributions to the theory of positive disintegration (TPD). The most fundamental idea of this theory was that forms of overexcitability make the individual more prone to emotional troubles due to the individual's intense focus on their misery. (Piechowski & Wells, 2021) Dabrowski, as a neurologist, viewed these challenges as a form of emotional development, but this cannot be accomplished without the growth and development of the individual's neural system (Piechowski, 2008). For this reason, Dabrowski titled his theory The Theory of Positive Disintegration (TPD). The concept of overexcitability encompasses five primary kinds, namely:

- **Psychomotor: E** denotes the elevated excitability that prompts a person to respond quickly and release his inner components through vigorous physical activity and movement.
- **Sensual: E** refers to a person's tendency to respond strongly to sensual overexcitability, which makes his sensual experiences unique, rich, and vibrant.
- **Imaginational: E** signifies the increased propensity of an individual to associate his experiences with similes, metaphors, creative imaginations, and the desire to personify material objects.
- **Intellectual: E** manifests a person's mental activity that encourages question-asking, directs him towards studying reality, and motivates him to seek knowledge of the facts and solutions.
- **Emotional: E** denotes emotional intensity, which is shown in a person's suffering from deep feelings of responsibility, self-criticism, self-rules, anxieties, and attachment to objects, people, and memories with a high susceptibility to anxiety. (Piechowski & Wells, 2021; Wirthwein et al., 2011).

Dabrowski hypothesized that the forms of overexcitability are among the methods a person uses to overcome this integration and acquire maturity. In addition to transferring the emotional experience to the parasympathetic nervous system, Piechowski (2014, 1999) explained several characteristics of overexcitabilities. It can be summed up as increasing the degree and duration of response in a manner consistent with the actual excitability and increasing the response's consistency with the real excitability (Piechowski,1999).

### Psychosomatic Disorders and Overexcitabilities:

Psychosomatic disorders are the propensity to suffer from physical disorders induced by psychological or social forces that cannot be medically explained. (Lipowski,1988). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), many psychological disorders, such as anxiety, sadness, phobia, and panic, exhibit physical manifestations (American Psychiatric Association, 2013)

Numerous research has demonstrated the close connection between emotional illnesses and psychosomatic symptoms, such as (Piccinelli & Simon, 1997; Marinaci et al., 2020). In contrast, we find that one of the most important hypotheses of the TPD theory is the suffering of gifted (students). These students are characterized by overexcitabilities, from emotional difficulties such as existential hopelessness, depression, anxiety, and other symptoms to a greater degree than normal (students) in terms of deep suffering and length of time. Moreover, their individuality on a neural basis generates the power of suffering. (Piechowski, 1999; Piechowski & Wells, 2021). This confirms the theory that their susceptibility to psychosomatic disorders results from the severity of their emotional problems that accompany patterns of overexcitabilities.

However, the researcher could not discover studies that explicitly support or refute this idea by establishing a correlation between overexcitabilities and psychosomatic diseases. The studies examining the connection between overexcitability and poor outcomes concluded that additional research is required to determine the nature of the relationship. The study of Karpinski et al. (2018) regarded 'intelligence' as a significant factor when comparing the prevalence of emotional disorders such as hyperactivity and autism among high-IQ members of the American Society "American Mensa, Ltd" to that of average normal individuals. This analysis supports the study (Harrison & Haneghan, 2011), which asserted a correlation between forms of overexcitability and the fear of the unknown, anxiety of death, and insomnia. However, this analysis cannot be relied upon entirely if we know the study results of Limont et al. (2014), which demonstrated that gifted individuals had lower neurotic trait scores than normal individuals. Nonetheless, the scores of neurotics for the entire sample (gifted and normal) were associated with emotional excitability. It indicates the necessity to examine overexcitability in individuals regardless of their aptitude and giftedness and its correlation with psychosomatic diseases.

## **Cognitive Emotion Regulation as a mediating mean between overexcitabilities and psychosomatic disorders:**

Some psychological measures can serve as a "mediator" between the kinds of overexcitabilities and psychosomatic diseases by providing interpretations and a perspective (positive or negative). The researcher hypothesized that Cognitive Emotion Regulation processes could serve as a "mediator" in the relationship between overexcitabilities and psychosomatic diseases.

Although emotional responses are rooted in the work of the neurological system, an individual can regulate, manage, and express them through cognitive emotion regulation processes (Garnefski et al., 2002). In defining the technique of interpretation for excitability stands, these processes are relevant because they might influence the character of the physiological, cognitive, or behavioral reaction to situations that cause stress or pressure (Garnefski et al., 2002). Since no previous studies examined the role of emotion regulation as a mediator between the two variables, the current research can examine this hypothesis based on studies that examined the relationship between emotion regulation and

overexcitability and studies that examined the relationship between emotion regulation and psychosomatic disorders.

The study of Kleinstäuber et al. (2019) is one of the studies that linked emotion regulation to psychosomatic disorders. It concluded that training in emotion regulation is an effective mediator between events and psychosomatic disorders. It led to a high to the medium percentage reduction in psychosomatic symptoms (in the patients).

In addition, Mazaheri (2015) study demonstrated the association between emotional regulation difficulties and psychosomatic diseases in patients with gastrointestinal disease. The study (Perrone et al., 2015) found that adult participants with a pattern of overexcitability scored lower on the emotion regulation scale for expressive repression. After analyzing 64 scientific articles, the study (Guney et al., 2019) discovered that the physical components of people with issues in emotion control have an excessive interaction pattern.

## Methods

The e-scales were completed by 269 male and female students from Prince Sattam bin Abdulaziz University. The final sample consisted of 204 female students accounting for 75.8%, and 65 male students accounting for 24.2%. Students ranged in age from 18 to 31 years ( $M = 20.6$ ,  $SD = 1.9$ ). 247 students, or 91.8%, were unmarried, while the remaining students were all married. The percentage of first-year students was 28.3%, while the percentage of second-year students was 27.7%. The percentage of third-year students was 23.1%, while the percentage of fourth-year students was 18.6%.

The percentage of students in health departments was 26%, in humanities departments, it was 28.6%, and in science departments, it was 45.4%. The GAT scores of students varied from 52 to 98 ( $M = 76.1$ ,  $SD = 9.3$ ). As for their summative assessment scores, the mean was ( $73.34$ ,  $M = SD = 11.64$ ) with a minimum of 47 and a maximum of 97.

The number of gifted students (those who qualified for the Saudi Giftedness and Creativity Program - Mawhiba based on results and defined measures of intelligence during their years of general education) reached 59, representing 21.9% of the student body. In addition, students' GPAs ranged from 1.9/5 to 5/5 ( $M = 4.2$ ,  $SD = 0.68$ ).

## Procedures:

The students completed the e-scales (demographic information, scales, types of overexcitability, emotion management, and psychosomatic diseases) by clicking on a link sent to their university e-mail addresses and WhatsApp groups using the snowball technique. The link was e-mailed to a select number of faculty members and students at Prince Sattam bin Abdullah University, who were then urged to share it with their university-only social networks. To encourage the students to participate in the study actively, it was

promised that they would receive awards (money rewards through a drawing) when the relationship was severed. They were also advised that their participation decision would not influence their grades or interests. In addition, they were informed that continuing to respond to the study's scales and e-mailing the link would be evidence of their consent to participate in the study. In addition, they were informed that their true name is not required but must provide a mobile phone number in case they win the award. Since there is no GPA for some first-year students, their GAT scores (abilities + summative test) were used to make up for the missing Academic Achievement values. There were nine of these values.

## Specifying the Gifted and Normal Students for Study Sample:

The quartiles for GPAs were determined independently for health departments, humanities departments, and science departments. Then, each group's upper and lower quartiles were determined such that the upper quadrant might represent the talented population in this department. The groupings in the lowest quartile represent typical students.

- To evaluate the study's hypotheses, the sample was separated into two categories:
- **Gifted and Talented Students:** It includes students from each department whose GPA was in the upper quartiles and those who qualified for the Saudi Giftedness and Creativity Program – Mawhiba before enrolling in the university.
- **Normal Students:** The normal children whose scores fell in the lower quartiles and who were ineligible for the Mawhiba program were specified in consideration of the vast number of samples and with the intent of bringing it closer to the sample of gifted students.

## Study Tools:

- **The Overexcitability Questionnaire II (OEQII) (Falk, et al., 1999):** This scale consists of 50 words representing the five types of hyperexcitability: psychomotor, sensual, imaginative, intellectual, and emotional. Each form has 10 statements, and responses were submitted using a 5-point Likert scale (ranging from "does not relate to me" to "strongly agreed"). Except for phrase no. 38 in "Sensual OE" and no. 44 in "emotional OE," which was negative, the phrases tended to go in the same direction, i.e., whenever the score increased, they signaled it. Sentence no. 38 in "Sensual OE" has been excluded from the current study since the value of the stability coefficients increased when it was eliminated. In addition, phrase no. 11 in "emotional OE" has been removed because the degree of corrective correlation between that phrase and the total degree of the theme has decreased from 0.3 to 0.2, and the alpha coefficients ranged from 0.76 to 0.83 for all themes, with total alpha coefficients reaching 0.90.
- **Cognitive Emotion Regulation Questionnaire (CERQ) (Gamefski et al., 2001):** The scale consists of 36 phrases containing nine emotional and cognitive strategies for coping with stressful situations or



incidents. Each scale or method consists of four phrases, with responses ranging from "It applies to me very strongly" to "It applies to me very weakly" on a 5-point Likert scale. In the current analysis, those phrases whose removal promotes theme stability have been eliminated. Thus, the phrase no. 20 in the theme "Acceptance" and phrase no. 7 in the topic "Putting Things in Context" were eliminated. Thus, the Cronbach Alpha Coefficients now vary from 0.58 for "Acceptance" and "putting things in perspective" to 0.75 for "positive reappraisal" and 0.81 for the entire scale. The researcher felt it reasonable to rely on the "Principal Component Analysis" (PCA) factor analysis undertaken by the authors to condense the nine themes of the scale. They concluded that two factors accounted for 60.4% of the contrast ratio's interpretation. The first factor consists of "positive emotion management," which includes acceptance, positive refocusing, planning, positive reappraisal, and perspective-taking. This aspect is referred to as "positive cognitive emotion control." The second factor consists of emotion regulation: blaming others, catastrophizing, ruminating, and self-blaming. This variable is called "negative cognitive emotion regulation" (Garnefski et al., 2001). In the present study, the value of " $\alpha$ " for the factor "positive cognitive emotion regulation" was 0.88, whereas the value of " $\alpha$ " for the factor "negative cognitive emotion regulation" was 0.85.

- **The Patient Health Questionnaire PHQ-15 somatization:** This self-scale, which measures general physical complaints over one month, has been utilized. The scale consists of 15 symptoms that account for 90% of physical symptom complaints documented in OTs, except upper respiratory system problems. (Ravesteijn et al, 2009). On a 3-point Likert scale, responses range from "it never bothers me" to "it bothers me a lot." The scale has been translated and implemented in other contexts and adapted for the Saudi context by (Al-Hadi et al., 2017). Because 93% of the sample comprised unmarried individuals, the phrase relating to difficulties during sexual activity has been removed from the current study. In the present study, Cronbach Alpha Coefficients reached 0.84, and Table 1 displays the psychometric features of the study's measures.

**Table 1** *Psychometric Properties of the Scales of the Study*

Measures	No of items	$\alpha$	Corrected items-total correlation	Min	Max	M	SD
OEQII	48	0.903					
Psychomotor	10	0.788	0.328 - 0.629	13	50	35.36	7.12
Sensual	9	0.786	0.341 - 0.662	11	45	36.49	6.14
Imaginational	10	0.83	0.394 - 0.633	10	50	34.17	8.48
Intellectual	10	0.806	0.302 - 0.607	20	50	39.68	6.55
Emotional	9	0.757	0.350 - 0.602	15	45	35.67	6.17
CERQ	34	0.81					
Self-blame	4	0.62	0.37-0.45	4	20	13.50	3.31
Acceptance	3	0.58	0.36-0.50	3	15	10.64	2.63
Rumination	4	0.69	0.32-0.58	4	20	14.84	3.43
Positive refocusing	4	0.63	0.35-0.51	4	20	14.77	3.17
Refocus on planning	4	0.74	0.51-0.56	8	20	16.22	3.02
Positive reappraisal	4	0.75	0.49-0.61	4	20	16.36	3.27
Putting into perspective	3	0.59	0.38-0.42	3	15	12.05	3.08
Catastrophizing	4	0.72	0.45-0.65	4	20	11.16	3.96
Blaming others	4	0.74	0.33-0.68	4	18	9.14	3.53
Positive regulation	18	0.88	0.35-0.67	48	77	77.76	11.47
Negative regulation	16	0.85	0.35-0.67	20	100	48.64	10.84
PHQ-15	14	0.83	0.21-0.61	14	45	27.35	5.77

## Statistical analysis

Utilizing IBM SPSS Statistics22 and Cronbach's alpha reliability coefficient, statistical studies were undertaken to determine the study's scales' reliability. The Pearson correlation coefficient was used to evaluate the fundamental hypotheses and assess the relationships between the study's variables. In addition, "IBM SPSS AMOS Graphic 26's" Mediation Analysis was used to confirm the direct and indirect impacts of the suggested model. Before beginning the "parametric statistical analyses" approach for the study's variables, the data's normal distribution was confirmed. In the case of large samples, Stevens (2009) recommended that it is not required to apply "moderation tests" (as their values are always statistically significant) and instead to rely on the values of skewness and kurtosis. Therefore, it is sufficient to ensure that the values of skewness and kurtosis for the variables of the study fall between (1- and 1+) and (2- and 2+), respectively. The values of coefficients of skewness for the current study variables ranged from (-0.757 to 0.023), and the values of coefficients of kurtosis ranged from (-0.72 to 0.58), indicating the potential of conducting parametric analyses on the variables of the study to test its hypotheses.

## Results

The findings of the T-test comparison between the two subgroups (gifted group and normal group) revealed that there are no significant differences between the two groups in any overexcitability, except

"Intellectual OE," which was elevated in the gifted group. The researcher ran another investigation and compared the gifted students, regardless of their talent, to the regular students, concluding that the conclusion was the same: the gifted students scored higher on "Intellectual OE" than the normal ones. (Table 2)

**Table 2** Differences between gifted and normal students concerning the forms of overexcitability

Form of Overexcitability	Subject of Differences	N	Mean	Std. Deviation	t	Sig. (2-tailed)
PM OE	Gifted	112	35.9196	7.31177	1.618	0.107
	Normal	107	34.3271	7.24865		
S OE	Gifted	112	37.0179	5.62649	1.225	0.222
	Normal	107	35.9907	6.71031		
IM OE	Gifted	112	34.3929	8.95772	.184	0.854
	Normal	107	34.1776	8.27911		
I OE	Gifted	112	40.4464	6.18315	2.021	0.044
	Normal	107	38.6168	7.19492		
E OE	Gifted	112	39.8661	5.99924	-.283	0.778
	Normal	107	40.1215	7.32624		

To answer the question of the direct impact of psychomotor, sensory, intellectual, imaginative, and emotional overexcitability (as the independent variable X) on psychosomatic diseases, using positive emotion regulation and negative emotion regulation as intermediary factors. The correlations between the study variables were determined using "The Pearson correlation coefficient" and "Mediation Analysis" in IBM Amos 29. The model's parameters were determined using "Maximum Likelihood Estimation" (MLE). (Table 3)

Table 3

*Pearson correlation coefficient between the forms of overexcitability and the forms of emotion regulation and psychosomatic disorders N = 269.*

	GPA	PM OE	S OE	IM OE	IOE	E OE	N CER	PCER	PHQ-15
GPA	1								
PM OE	0.002	1	-	-	-	-	.-	-	-
S OE	0.005	.392**	1	-	-	-	-	-	-
IM OE	-0.047	.180**	.443**	1	-	-	-	-	-
IOE	0.058	.446**	.487**	.382**	1	-	-	-	-
E OE	-0.022	.174**	.385**	.558**	.222**	1	-	-	-
N CER	-0.051	.091	.217**	.513**	.237**	.444**	1	-	-
P CER	0.136*	.297**	.329**	.012	.455**	.004	-.039-	1	-
PHQ-15	0.045	.130*	.298**	.428**	.198**	.457**	.283**	.015	1

\*At a significance level less than 0.05 \*\* At a significance level less than 0.01 \*\*\* At a significance level less than 0.001

The following table (4) explains the indicators of best conformity to the proposed model.

Table 4  
*Indicators of best conformity to the model of the study*

indicators of best conformity	Calculated Value	Accepted Values
Chi-square	0.251	Chi-square/degrees of freedom 3
Degrees of freedom	1	
Chi-square/ Degrees of freedom	1.317	
The goodness of Fit Statistic (GFI)	.999	GFI $\geq$ 0.95
Adjusted Goodness of Fit Statistic (AGFI)	.956	AGFI $\geq$ 0.90
Tucker-Lewis Index (TLI)	0.985	TLI $\geq$ 0.95
Comparative Fit Index (CFI)	0.999	CFI $\geq$ 0.95
Incremental Fit Index (IFI)	0.999	IFI $\geq$ 0.95
Normed Fit Index (NFI)	0.999	NFI $\geq$ 0.95
Root Mean Square Error of Approximation (RMSEA)	0.034	RMSEA < 0.08

The best conformity of the virtual model may be determined from the table above by comparing the values of the model's generated indicators to the approved standard values, demonstrating the track model's conformity to the current study's data sample. The graph below depicts the values of direct and indirect impacts between the study's variables. (Fig. 2)

## Calculation of Direct and Indirect Effects between the Variables of the Model:

**a) Direct Effects:** The following table explains the standard values and their statistical significance for the direct effects of overexcitabilities (psychomotor, sensual, intellectual, imaginal, and emotional) on positive emotion regulation, negative emotion regulation, and psychosomatic disorders. (Table 5).

**Table 5** *Model of the Study that Illustrates the Standard Values*

			Standard Values	Standard Error	Value "Z"	Statistical Significance		
overexcitabilities	psychomotor	→	Positive Emotion Regulation	0.125	0.096	1.304	0.192	
	sensual	→		0.412	0.122	3.369	***	
	imaginational	→		-0.301	0.091	-	3.312	***
	Intellectual	→		0.720	0.113	6.395	***	
	emotional	→		-0.030	0.111	-	0.963	0.336
overexcitabilities	psychomotor	→	Negative Emotion Regulation	-0.044	0.089	-	0.626	
	sensual	→		-0.139	0.113	-	1.223	0.221
	imaginational	→		-0.488	0.084	5.777	***	
	Intellectual	→		0.144	0.105	1.380	0.168	
	emotional	→		0.433	0.110	3.941	***	
overexcitabilities	psychomotor	→	Psychosomatic Disorders	-0.003	0.049	-	0.984	
	sensual	→		0.076	0.063	1.197	0.231	
	imaginational	→		0.133	0.054	2.681	**0.007	
	Intellectual	→		0.015	0.061	0.244	0.808	
	emotional	→		0.305	0.062	4.929	***	
Positive Regulation	Emotion	→		-0.012	0.031	-	0.700	
Negative Regulation	Emotion	→		0.008	0.033	0.236	0.814	

\*At a significance level less than 0.05 \*\* At a significance level less than 0.01 \*\*\* At a significance level less than 0.001

The (Table 5) illustrates the following:

- It indicates the direct effect of scores of students in the forms of overexcitability (Sensual:  $0.412 \beta =$  and Intellectual:  $0.720 \beta =$ ) and negative effect for the imaginational form  $0.301 \beta =$  on their scores in "Positive Emotion Regulation" and all were at a degree which is less than 0.001. Also, it is observed that there is no indication of the direct effect of students' scores in the forms of overexcitability (psychomotor, emotional) on their scores in positive cognitive emotion regulation.
- It indicates the direct positive effect of students' scores in the forms of overexcitability (imaginational  $0.488 \beta =$  and emotional  $0.433 \beta =$ ) at a degree that is less than 0.001 on the variable (negative emotion regulation). Also, it is observed that there is no indication of the direct effect of students' scores in the forms of overexcitability (psychomotor, sensual, intellectual) on their scores in negative emotion regulation.

- A direct positive effect emerged for students' scores in overexcitability (emotional) on the psychosomatic disorders  $0.305\beta =$  at a significance level less than 0.001 and  $0.133\beta =$  in imaginal at a less significant level than 0.007. In contrast, no significant effect appeared in other forms of overexcitability on psychosomatic disorders.
- No indication was found for the direct effect of students' scores in adaptive and negative emotion regulation on psychosomatic disorders.

**b) Indirect Effects:** To get the values of indirect effects, bootstrapping has been used with a sample of 10000 at the confidence limit of 95%. The following table explains the standard values, their statistical significance, lower limits, and upper limits of confidence intervals for the indirect effects of forms of overexcitabilities (psychomotor, sensual, intellectual, imaginal, and emotional) on psychosomatic disorders through the variables of negative and adaptive emotion regulation as intermediate variables among the research sample. (Table 6).

Table 6  
Standard Values for the indirect effects of the variable of overexcitabilities on the variable of psychosomatic disorders

Variables	Standard Values	Lower	Upper	P
<b>Indirect Effect of Forms of Overexcitabilities through variable (positive emotion regulation)</b>				
psychomotor	-0.001	- .016	-0.005	0.440
Sensual	-0.005	0.037	0.018	0.605
imaginal	0.004	-0.013	0.028	0.638
Intellectual	0.004	0.013-	0.028	0.638
emotional	0.001	0.005-	0.021	0.444
<b>Indirect Effect of Forms of Overexcitabilities through variable (negative emotion regulation)</b>				
psychomotor	-0.000	0.012-	-0.006	0.742
Sensual	-0.001	0.020-	-0.009	0.654
Imaginational	0.004	0.031-	0.039	0.832
Intellectual	0.004	0.031-	0.039	0.832
Emotional	0.003	0.028-	0.038	0.810

The above table illustrates that there is no indirect effect of emotion regulation with both types (adaptive and negative) as a mediating variable between the scores of the students on all forms of overexcitabilities on their scores and psychosomatic disorders. Thus, all significant effects in this model are "direct."

## Discussion

The findings of the T-test comparison between the two subgroups (gifted group and normal group) revealed that there are no significant differences between the two groups in any overexcitability, except "Intellectual OE," which was elevated in the gifted group. It demonstrates that the levels of overexcitabilities decrease with age, except intellectual overexcitabilities. The results of the research supported this conclusion (Nordin, 2007). Adults and college students participated (AlSulaiman, 2016; Wirthwein et al., 2011). The TPD hypothesis reveals that an individual's growth and maturation are impossible without the development of the nervous system (Piechowski, 2008). Dabrowski's assumption says that the forms of hyperexcitability are advanced and developmental factors that bring a person to integration and self-realization after he has been through various stages of disorder and rebellion. (Piechowski 2008, 2014, 2017). Previous research demonstrated that the disparities in overexcitabilities between talented and normal children and adolescents existed before university life (Harrison & Haneghan, 2011; Limont et al., 2014; Algadheeb, 2020).

In addition, the Correlations Matrix between the variables of the study revealed that as students' overexcitabilities and negative cognitive emotion regulation increased, so did their psychosomatic disorder ratings. In addition, the track analysis of the singularity of two types of overexcitabilities (emotional and imaginal) from the entire study variables demonstrated a direct effect on psychosomatic diseases. This result is consistent with the study's findings (Harrison & Haneghan, 2011) that show a favorable association between all forms of overexcitabilities, albeit varying degrees, and the dread of the unknown, anxiety of death, and insomnia (like psychological and physical disorders). The most vital relationships were between emotional and imaginative overexcitement. In addition, research (Limont et al., 2014) on the singularity of emotional and imaginative overexcitability indicated a positive link with neurotic characteristics. The following is a separate analysis of each overexcitability:

### Emotional OE

By referring to the theoretical hypotheses, the rationality of the effect of emotional OE on psychosomatic disorders can be deduced, as it is consistent with what Piechowski (1999) stated, namely that individuals with a high degree of overexcitability are more likely to transfer their emotional sufferings to the sympathetic nervous system due to the sharpness of their responses. Consequently, people become more prone to psychosomatic diseases. Even though Piechowski (2013) generalized all sorts of overexcitability and did not identify emotional OE in this impact, emotional emphasis makes an individual more susceptible to suffering from responsibility, self-criticism, anxieties, anxiety, and attachment to objects, people, and locations. (Piechowski & Wells, 2021; Wirthwein et al., 2011) All of the above emotions increase a person's suffering from emotional problems, which studies have linked to psychosomatic ailments (American Psychiatric Association, 2013; Piccinelli & Simon, 1997; Marinaci et al. 2020). This is probably how the logic of the relative effect strength of emotional OE on psychosomatic diseases relative to the effect of imaginative OE is explained.



The above definition of emotional OE clarifies the rationale of emotional OE's direct effect on negative emotion regulation, whose dimensions include rumination, catastrophe, self-blame, and blaming others. As a result, a person tends to focus his emotional energy on situations and events, magnifying them in his mind and making his mind a prisoner of his sufferings because of meditating on his sorrows along with emotions of responsibility and self-blame.

### **Imaginational OE**

The direct effect of imaginational OE on psychosomatic disorders revealed by the results can be interpreted considering what the tracks model revealed, namely, that the most vital relationship between the various types of overexcitability was between imaginational and emotional OE, which reached 0.59. This shows that people with imaginational overexcitability are susceptible to psychosomatic diseases due to the detrimental impacts of emotional overexcitability. Moreover, they intensify the unpleasant occurrences surrounding them, their sufferings, and their pains in their minds and live them as if they were true. As he lives in the world of his creation, he becomes the source of his suffering. (Piechowski & Wells (2021). Additionally, the direct influence of imaginational OE on regulating negative emotions might be viewed as the negative consequences of imaginational OE that assist in exaggerating unfavorable experiences and viewing them from a catastrophic perspective. Therefore, the phrases associated with imaginational overexcitability (such as "I feel that my imaginational world is genuine for me," "the things that I imagine in my mind seem as if they are real," and "I greatly enjoy magnifying the events and incidents") reveal a person who lives in a world far removed from reality. In addition, the data demonstrated a direct negative influence of imaginational OE on positive emotional regulation, such that anytime the individual's imaginational overexcitability reduced, positive emotional regulation increased. This subject is deemed sensible because weak imaginative overexcitability leads to a person realistically viewing things, free of exaggeration and ruminating. It manifests through the concepts of good emotion regulation (acceptance, refocus on planning, putting into perspective).

### **Psychomotor OE**

The track analysis did not reveal any direct relationship between psychomotor OE and emotion regulation (both positive and negative) and psychosomatic disorders, despite the existence of a significant relationship between psychomotor OE and positive emotion regulation, whose value is 0.297 at a significance level of less than 0.001. This is because the track analysis is affected by partial correlations with other variables, affecting the relationship between the two variables. Therefore, the relationship between psychomotor OE and positive cognitive emotion regulation can be explained by psychomotor activities that help people with psychomotor OE regulate their surroundings. However, this association was not intense until its effect on emotion regulation (both positive and negative) and the psychosomatic diseases began to emerge in the track analysis.

### **Sensual OE**

Track analysis found a direct link between sensory overexcitability and positive emotion regulation. In addition, it was determined that there is no direct effect on negative emotion regulation despite a correlation with a value of 0.217 at a significance level of less than 0.001. It can be deduced from what (Piechowski & Wells, 2021) stated that sensory overexcitability has a variety of impacts. A heightened sensitivity to simple and elegant sensual overexcitability is among the good impacts of sensual overexcitability. In contrast, these individuals communicate their emotional worry through excessive sensory responses, such as extreme pleasure from amusement, eating, sex, and alcohol consumption. Therefore, the positive aspect of sensual overexcitability is that people with it can enjoy the beauty of nature and all that surrounds them by feeling, listening, and seeing, as they are the source of their happiness, shift their thinking towards them, and approach problems positively and optimistically.

Also, sensory overexcitability can be viewed as a factor that aids attention and consciousness, which alleviates daily stresses. Increasing sensory overexcitability aids in positive emotional regulation, one of the elements of which is "positive refocusing," exemplified by expressions such as "I ponder over wonderful things that cost me nothing" and "I ponder over beautiful things rather than painful occurrences." The negative side of sensory overexcitability manifests itself in the relation with a value of 0.298 at a significance level of 0.001>.

The effect of the degree of relation, even if it was weak, did not have a direct effect on psychosomatic disorders. Still, it did exist through which the negative aspect could be interpreted, such as the effects of sensual overexcitability, manifested in indulging in entertainment and sensory pleasures represented by restaurants, drinks, and other pleasures that may have a negative impact on their obesity and its related diseases. In Islam, sexual pleasure outside of the marriage bond is outlawed (it is worth noting here that 92% of students were categorized as unmarried). Therefore the decreasing relationship reflects the decreasing negative component of sensual overexcitability among the Muslim community. In addition, wine use is prohibited by Islam and is punishable in Saudi society.

## **Intellectual OE**

The examination of the track demonstrated the direct relationship between cerebral overexcitability and positive emotion regulation. This conclusion is deemed "logical" because cerebral overexcitability enhances the degree of realistic thinking, which rejects negative interpretations that emphasize rumination, catastrophes, self-blame, and others without any logic that can accept such interpretations.

Even though there are no direct effects of intellectual overexcitability on psychosomatic disorders and negative cognitive emotion regulation, weak relationships did emerge, albeit at a level of less significance, which can be partially explained by the mutual relationships between the various forms of overexcitability (imaginational, sensual, and emotional) and their adverse effects.

Through positive and negative emotion management, there was no indirect effect of hyperexcitability on psychosomatic diseases, according to the study results. It confirms that overexcitability is regarded as

fixed personal qualities and characteristics that emerge from the unique neural nature of individuals with overexcitability, which transfers their pain to the sympathetic nervous system. (Piechowski, 1999, 2013).

In addition to being "involuntary" and uncontrollable, one of the most significant features of the parasympathetic nervous system is that its reactions are activated during times of defense or attack (Tindle & Tadi, 2021). Thus, we show that the involuntary character of overexcitability makes it difficult for cognitive methods such as emotion management to have an effect.

## **Conclusion**

In conclusion, the current study corroborated the results of earlier studies conducted at the university level to distinguish the intellectual overexcitability disparities between the gifted and talented and the general population. Also, a recent study confirmed the hypothesis that overexcitability might influence average students, as its effect is not limited to talented kids alone. Its effect on psychosomatic problems arose through emotional and imaginative overexcitability, and it supports one of the ideas of positive disintegration theory, namely the transfer of the sufferings of persons with overexcitability to the parasympathetic nervous system. Despite the effect of cognitive mediator, reflected in positive and negative emotion regulation in overexcitabilities, it plays no role in the indirect relationship between overexcitabilities and psychosomatic diseases.

The previous results probably broaden the possibilities for tracking the changes in overexcitabilities throughout the various periods of life using longitudinal and cross-sectional research that extends beyond university education. In addition, the results pave the way for future studies on the impacts of overexcitabilities on clinical variables, negative social psyche, and, more particularly, its effects, such as anxiety, sadness, resiliency, and social competence, regardless of whether the samples are normal or clinical.

## **Determinants of the Study:**

The study's findings are dictated by the quantitative scales applied to it. The results of the qualitative investigation based on interviews and observations are more accurate. Psychosomatic disorders, adopted as a negative consequence of overexcitability, require greater precision to ensure that the individual is not suffering from medical ailments owing to "organic causes" rather than psychological or social factors.

## **Declarations**

### **Ethics approval and consent to participate**

Permission to conduct this study was requested to Prince Sattam bin Abdulaziz University, through Vice-Rector for Graduate Studies and Scientific Research letter no. 14371029244. And I have the official university's approval to do this study.

With students agrees via questioner link <https://forms.gle/5D11mjSC3SihTGeF7> and the Student and University Agreement Attached.

Further, the authors have no conflicts of interest with any individual or organization. We certify that the submission is original work and is not under review at any other publication. It is attested that the study was performed fully in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

### **Consent for publication**

I, the undersigned, give my permission for identifying details to be published in the above-mentioned journal and article. These details can be tables, information, case studies, questionnaires, or any other details in the text. I confirm that I have seen and been given the opportunity.

To read both all the material and the article to be published by Annals of General Hospital Psychiatry. I have full responsibility for this issue because I am alone, and have no other authors with me.

### **Availability of data and material**

The data support this study are available in the manuscript.

### **Competing interests**

I declare the authors have no competing interests or other interests that might be perceived to influence the interpretation of the article.

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The author paid all out-of-pocket costs for the design of the study, data collection, analysis and interpretation of the data, and writing of the manuscript "Not applicable".

### **Authors' contributions**

The individual contributions to this manuscript are managed by the author himself.

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# Figures

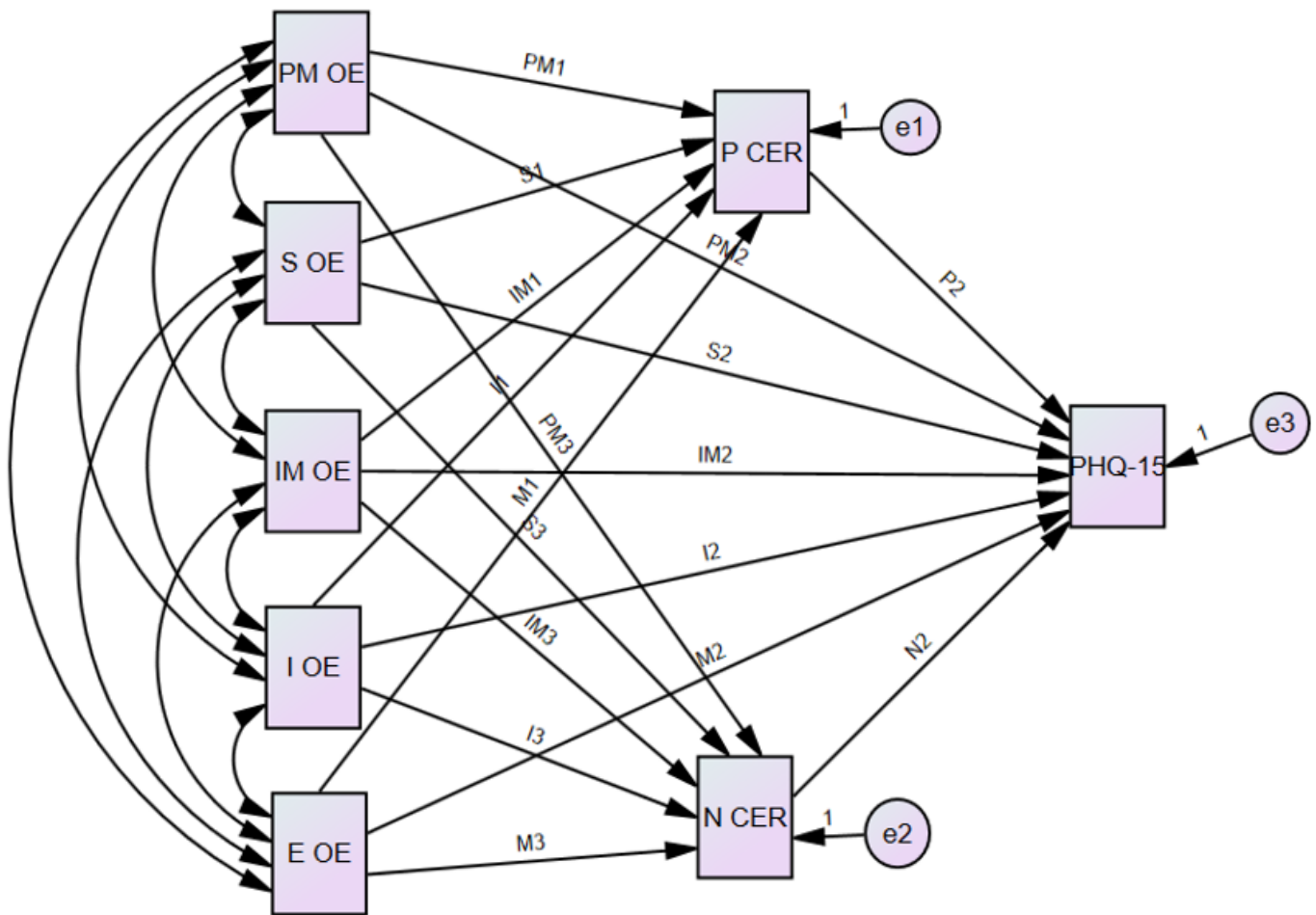


Figure 1

The virtual model of direct and indirect effects for the study variables.

PM: OE: Psychomotor. S: OE: Sensual. IM: OE: Imaginational. I: OE: Intellectual. E: OE: Emotional. P CER: Positive Cognitive Emotion Regulation. N CER: Negative Cognitive Emotion Regulation. PHQ 15: Psychosomatic Disorders.