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Self- Control, Self-Regulation and Procrastination as Psychological Predictors for Ego Depletion among University Students

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Abstract

This study aims to identify ego depletion and the effect of both gender and age among a sample of university students. It also proposes that when depletion takes place it depends on the effect of self-control, self-regulation, and procrastination upon the person.The study follows the descriptive approach. The descriptive diagnostic Sample consisted of (n=400)students of university students,age between(18-21)years.The measurements to diagnose the dynamic variables (ego depletion, self-control, self-regulation, and procrastination)were scales (prepared by the researcher) and to clarify the most important components of these measures in the light of what has been detected from the previous standards.As for the Statistical Methods,the researcher could determine the statistical methods used to address the study hypotheses in the light of several variables, including: size of the sample,scales used and type of the hypotheses. Multiple leaner regression equation was used to detect how far the independent variables can affect and predict possible changes of the ego-depletion's level.The results revealed a statistically significant correlation between the mean scores of the demographic variable(age) upon ego- depletion scale in favor of the age between (19-21) years. The research also revealed statistically significant differences between the mean scores of males and females (gender) upon ego-depletion scale in favor of males.The study also detected statistically significant correlations between ego depletion (dependent variable) and self-control,self-regulation, and procrastination (independent variables) as a boot to prove that the independent variables can predict the level of the dependent variable **.**

 Key Words: Ego depletion – Self control- Self regulation – Procrastination- Multiple leaner regression

Introduction:

The theory of ego-depletion has come under intense scrutiny within the past few years. Beginning around 2010, researchers conducted meta-analyses and large replication studies that have investigated this topic and found a wide range

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of evidence for and against the existence of an ego-depletion effect. Although the goal has been to determine whether this effect exists or not, this research has proved that the answer may be more complicated than that. Much recent research suggests that willpower—the capacity to exert self-control—is a limited resource that is depleted after exertion. The ability to regulate our thoughts and actions to avoid procrastination, and to inhibit certain impulses and responses, are skills that we use every day. Though they are abilities we all have, some people are better able to resist temptations and suppress impulses, regulate their self than others. To that end, the same person might exhibit more of these skills on one day versus another, but there can also be variation within a single person's abilities. The exhibition of self-control, or lack thereof, is partially contextdependent, such that different tasks can have varying effects on use and depletion of a person's self-regulation. The underlying causes and mechanisms of the variation in these skills are not completely understood, but many theories have been proposed(Kathleen Vohs,2020).

 Theoretical framework:

As (Wegener et al., 2007, p.12) defined ego depletion as a state of psychological exhaustion and lack of internal energy for the individual resulting from attempts to control the conflicts arising between the internal desires of the individual and the reality that imposes on him a set of criteria and determinants. Ego depletion can be defined as a state of variable decline in the ability to self-control, which is evident through the feeling of psychological and physical exhaustion, poor performance of stressful tasks, distraction, and low self-control.

This energy needed for self-control is called the term will, and the actions and activities that an individual performs for self-control - which in turn leads to a lack of this will - are called voluntary actions, which require prior training of the will so that the individual can perform them. Ego depletion is a variable decrease in the ability to self-control, which is evidenced by the feeling of psychological and physical exhaustion, poor performance of stressful tasks, distraction, and low self-control (Da Silva.Set al, 2019).

Change means that the individual's ability to self-control changes according to the internal energy necessary to perform the tasks of self-control, which in turn changes according to situations and situations; Situations in which the individual needs to act in an acceptable way daily or control his desires and desires in which this energy decreases, and also decreases from time to time, so individuals try to

take a break at the end of the day to replenish the energy that has been exhausted throughout the day after spending a long day doing tasks that require self-control (Chris Englert,2021)

The notion that self-control is central, that it underlies a far range of different behaviors, is what made ego depletion special. It is the broad applicability of ego depletion that captivated social psychology for two decades. Hundreds of studies were soon being published implicating ego depletion in all matter of outcomes: eating, drinking alcohol, exercise, aggression, test performance, smoking, drug use, cheating, empathy, racism, marital infidelity, to name just a few (Baumeister & Tierney, 2011)

On dealing with the issue of the effect of ego-depletion on both age and gender , (Da Silva et al , 2019) replicate the finding that females perform better than males in the task switching type of multitasking. This study also find that multitasking impairs cognitive reflection through ego depletion, regardless of gender. However, the cognitive reflection of males is relatively more weakened after multitasking. This suggests that ego depletion may be an interesting candidate mechanism to explain gender differences in multitasking performance. According to (Wang L, et al (2015) women have been found to experience decreased self-control during premenstrual syndrome, as the ovaries work harder during this phase of menstruation and older people may be more resistant to ego depletion than their younger counterparts.

Hypothesis ١: **There are statistically significant differences between the mean research sample scores of both genders on the measure of ego depletion.**

(Veronika Job ,Carol S Dweck, Gregory M Walton, 2010) found that individual differences in lay theories about willpower moderate ego-depletion effects: People who viewed the capacity for self-control as not limited showed enhanced rather than diminished self-control after a depleting experience. (Veronika Job ,Carol S Dweck, Gregory M Walton, 2010)- in their longitudinal field study - found that theories about willpower predict change in eating behavior, procrastination, and self-regulated goal-striving in depleting circumstances. Taken together, the findings suggest that reduced self-control after a depleting task or during demanding periods may reflect people's beliefs about the availability of willpower rather than true resource depletion.

Regulation Some of the most provocative and influential research of the past decade has been conducted by many researchers, who have proposed and tested the strength model of self-control (e.g., Baumeister, Bratlavsky, Muraven, & Tice, 1998; Baumeister, Vohs, & Tice,2007). This model suggests that acts of self-regulation consume a resource that is limited, leaving people in a state of ego-depletion and making them less able to exert self-control on a subsequent task. The strength model of self-control has inspired considerable research and accounts for an impressive array of empirical findings, including depletion effects on information processing (Fischer, Greitemeyer, & Frey, 2008), intellectual performance (Schmeichel, Vohs, & Baumeister, 2003), impression management (Vohs, Baumeister, & Ciarocco, 2005), and violent responses to partner provocation (Finkel, DeWall, Slotter, Oaten, & Foshee, 2009).Some research, however, suggests that the exertion of self-control does not invariably reduce the capacity for subsequent self-control (e.g., Moller, Deci& Ryan, 2006; Tice, Baumeister, Shmueli, & Muraven, 2007). For instance, people who are motivated to control themselves because of incentives may not show ego-depletion effects (Muraven & Slessareva,2003). Most relevant to the present research, expectancies about diminished self-control following exertion can moderate ego-depletion effects. In one study, some participants were told that performing an effortful task (controlling their emotions) could improve performance on a subsequent task (Martijn, Tenbült, Merckelbach, Dreezens, & de Vries, 2002). These participants showed no decrease in performance on the subsequent self-control task (squeezing a handgrip).

In the context of self-regulation (Veronika Job ,Carol S Dweck, Gregory M Walton, 2010) propose that people differ in their implicit theories about the availability and depletability of self-control resources (or their "willpower"). Some people may think self-control is a limited resource, as described in the strength model of self-control. Others may believe that self-control is not limited and perhaps even that engaging in a strenuous task can activate self-control resources. Researchers call these the limited resource theory and the nonlimited resource theory, respectively. This study suggests that these theories affect how well people self-regulate when demands on self-control accumulate.

There is abundant evidence to indicate the domain-general nature of ego depletion: When individuals perform a second self-control task immediately after a previous one, they exhibit poor performance in a knowledge-retrieval test (Englert & Bertrams, 2017), because they will have difficulty in solving problems

and reasoning (Schmeichel, Vohs, & Baumeister, 2003). When individuals are ego-depleted, they are more likely to engage in aggressive behavior (Barlett, Oliphant, Gregory, & Jones, 2016), unsafe sexual behavior (Gailliot & Baumeister, 2007), and immoral conduct (Gino, Schweitzer, Mead, & Ariely, 2011).

In everyday life people show a remarkable capacity to regulate the self and overcome the impulses and drives that tempt us to overeat, drink too much alcohol, take harmful recreational drugs, engage in violent actions when provoked, say hurtful things to others, spend money beyond our means, engage in inappropriate sexual activity, or procrastinate when we should be working (Steel, 2007). This ability to attain deliberative control over impulses (Fujita & Han, 2009) and abstain from gratifying immediate needs and desires is extremely adaptive and enables people to engage in goal-directed behavior to bring about long-term desirable outcomes (Fishbach & Labroo, 2007). If people were unable to regulate their behavior, life would become a series of unconstrained impulsive actions to service immediate urges, desires, and emotions.

Hypothesis 2: **The second hypothesis: The independent variables: (self-control, self-regulation, procrastination) have a predictive ability to explain the percentage of change in the dependent variable: (ego depletion) among university students.**

Research Questions:

This study aims to explore and provide descriptive support for the following research questions:

Q1: Are there possible statistically significant associations or correlations between demographic variables (Age- Gender) and ego depletion level.

Q2: Can ego depletion's level be predicted by the level of (self-control – self-regulation – procrastination)?

Participants:

Participants were (400) of university students, age between (18-21) years, both gender, who were enrolled in Ain Shams University and Cairo University. They

were each randomly chosen to apply the scales of the study. Of the participants, 48.7% were female students, their ages ranged from 18 to 21 (*M*= 31.08, *SD*= 4.12) and male students were 51.3 % their ages ranged from 18 to 21 (*M*= 32.33, *SD*= 5.46). The final *N* = (400). By analyzing statistical values, and considering the interpretation of those values through graphs of statistical description of the sample characteristics, kurtosis and skewness metamorphosis coefficients were limited to (1) of kurtosis (3) of skewness, indicating the moderation of distribution of research variables, The parametric methods of T testing two independent samples (to calculate the factor of significance of differences between the mean averages of research variables by different demographic variables) and the equation of simple linear regression were used to detect the relative contribution of the independent variable to the dependent variable. In addition to some statistical transactions to calculate validity and stability.

Procedure and Measures:

The study introduced the measurements to diagnose the dynamic variables prepared by the researcher (ego depletion, self-control, self-regulation, and procrastination) and clarify the following: the most important components of these four measures in the light of what has been detected from the previous standards. All participants completed the scales, who didn't complete any of the scales the researcher excluded him or her. The wording and the terms of the scale were formulated in the light of several considerations, including (do not start phrases with negative words, not to be vague or suggestive, preferably not to use exaggeration formulas, not to include dual formulations, to formulate phrases between negative and positive), and the formulation of items came in the form of comprehensive information for the areas to be measured, which fall under the umbrella of the variable. Scales instructions include checked data (name, type, age, scale instructions). Social desirability of the scale: mean the formulation of vocabulary in a way that does not suggest to the examinee the choice of the socially desirable response, and to verify the activation of social desirability as one of the criteria of a good scale in the social and emotional aspects of human behavior, several conditions must be met when formulating the previously mentioned items; In addition to not showing the real name of the scale on the cover of the final editing, the vocabulary of the components of the scale is distributed in a random manner; In order that the examinee does not know the main objective of the scale and does not choose the socially desirable answer in consideration of objectivity.

In their final forms, each scale consists of 40 items divided into four sub-components related to every variable. Positive statements are matched by three options, which are (yes - sometimes - no) of which the positive answers receive degrees (3-2-1), and the negative statements follow the reversed order (1-2-3), and therefore the total score of the scale ranges between (40-120), so that the high degree indicates the high level of the variable and vice versa, there is no specific time for the answer and the expressions apply to the sample.

Table (1) The Main Components and The Number of Items for Each Dimension in The Final Form of The Ego Depletion Scale

Scale components	Item number	Total
Social distress	1-8-13-14-22-27-30*-35-37-40*	10
Mental draining	2*-4-9-10*-15-23-24-25-28-31-32	11
Impulsivity	3-5-6-16*-19-20-21-33-34-38*	10
Fatigue	7-11*-12-17-18-26*-29-36-39	9

negative item (*)

Table (2) The Main Components and The Number of Items for Each Dimension in The Final Form of The Self-Control Scale

Scale components	Item number	Total
Concentration	1-6-7-12-17-21-22-28-32-33-40	11
Emotional Regulation	2-5-9-13-16-20-23-27-34-38	10
Perseverance	8-10-14-18-24-25-29-30-35-39	10
self-competence	3-4-11-15-19-26-31-36-37	9

negative item (*)

Table (3) The Main Components and The Number of Items for Each Dimension in the Final Form of the Self-Regulation Scale

Scale components	Item Number	Total
Self-guidance	1-5*-9-12-15-20-26*-29-33-37	10
Self-monitoring	2-3-8-14*-21-27-30-34-39*	9
Self-assessment	6-10*-13-17-18-22*-23-31-35*-38	10
Self-consolidation	4-7-11*-16-19-24*-25-28-32-36-40*	11

negative item (*)

Table (4) The Main Components and The Number of Items for Each Dimension in the Final Form of the Procrastination Scale

Scale components	Item Number	Total
Academic Self-efficacy	1-4*-9-12-15-16-24-25*-28-32-39	11

Learnability	5-6-11-17-26*-27-31-35-37*	9
Tuning resistance	2*-3-8-14-18-20-21-30-34*-38	10
Time Management	7-10*-13-19-22*-23-29-33-36-40	10

negative item (*)

Scales stability: The psychometric efficiency of the scales was calculated on a sample of (n = 400) students of both sexes. It was found that the scales have high rates of stability, as the stability was calculated using the re-test method the results were nearly the same between the two measurements and split-half method (0.682) for ego depletion, (0.623) for self-control, (0.510) for self-regulation and (0.705) for procrastination. The correlation coefficient correction was calculated using the Spearman-Brown equation, to calculate the overall reliability coefficient = (0.811) for ego-depletion, (0.791) for self-control, (0.886) for self-regulation and (0.910) for procrastination.

The stability was also calculated using the Kweder-Richardson equation KR 21:

$$\text{KR} = \frac{k}{k-1} \left(1 - \left(\frac{X(K-X)}{K \times \text{SD}} \right) \right)$$

K = the number of test items, X = the mean, SD = the square of the standard deviation, and the reliability coefficient is (0.746).

The stability of each scale was also calculated using the internal consistency method to ensure the homogeneity of the test by calculating the correlation coefficients for each component and the scale as a whole.

Table (5) correlations between the components of the ego-depletion scale and the overall score of the scale

Components	Correlation Coefficient
Social distress	0.706**
Mental draining	0.768**
Impulsivity	0.709**
Fatigue	0.487**

*statistically significant at the level (0.05), ** statistically significant at the level (0.01)

Table (6) correlations between the components of the self-control scale and the overall score of the scale

Components	Correlation Coefficient
Concentration	0.569**
Emotional Regulation	0.431*
Perseverance	0.303*
self-competence	0.521**

*statistically significant at the level (0.05), ** statistically significant at the level (0.01)

Table (7) correlations between the components of the self-regulation scale and the overall score of the scale

Components	Correlation Coefficient
Self-guidance	0.849**
Self-monitoring	0.737**
Self-assessment	0.773**
Self-consolidation	0.821**

*statistically significant at the level (0.05), ** statistically significant at the level (0.01)

Table (8) correlations between the components of the procrastination scale and the overall score of the scale

Components	Correlation Coefficient
Academic Self-efficacy	0.644**
Learnability	0.841**
Tuning resistance	0.553**
Time Management	0.721**

*statistically significant at the level (0.05), ** statistically significant at the level (0.01)

The previous stability coefficients are considered acceptable internal stability coefficients and are statistically significant at a significance level of (0.01) (ie, 99% confidence and 1% doubt) between the components of the ego-depletion scale and the total degree of the scale. The value of the correlations ranges between (0.487: 0.768) for the ego depletion scale, (0.849: 0.821) for self-regulation scale, (0.569: 0.521) for self-control scale and (0.644: 0.721) for the procrastination scale. This indicates the internal coherence of the scale and indicates that the scales in their final forms are characterized by stability and high efficiency that indicates that the scales can be applied to the sample.

Factorial credibility: means the rotation of the components of the scale around strong factors that explain a large percentage of the variance of responses, determining the factors and the correlation between the factors, and determining the variables that fall under one or several factors. The varimax is a commonly used orthogonal factor rotation method for simplified factor

structures (Hair, 2010). The significance of the factorial validity of the scales was extracted through factor analysis of vocabulary using **exploratory factor analysis (EFA)** using the "Hottling" method the main components, the "Principle Components", and the use of the "Kaiser" test, the lower limits for determining the number of factors, so that the factor is considered essential if the value of the potential root is Eigen value ≥ 1.0 the correct one, then the extracted factors were rotated orthogonal rotation - assuming the independence of the factors - by Varimax method, and finally the intrinsic saturation of the item was determined by the factor as ≥ 0.3. By quantitatively reading the matrix of interrelationships between the variables included in the Correlation Matrix, the researcher find that there is no correlation higher than 90%, and therefore no variables were deleted, and the value of KMO (0.513) which is a ratio > (0.50) and thus is an indicator that the researcher is confident of the adequacy of The number of sample members, and given the value of the Bartlett test for circularity as an indicator of the relationship between the variables, the researcher find that the level of significance = (0.000) and since it is less than (0.05), it is statistically significant and acceptable. Hence, the researcher adopted principal components with varimax as an (EFA) rotation method, an item with a factor loading over 0.50 can be interpreted as having practical significance (Hair, 2010).Based on the previous criteria, four factors were extracted for each scale .

Confirmatory factor analysis (CFA): To address this issue, CFA has been conducted to examine the factor structure of the scales using the diagonally weighted least squares (DWLS) method. The usage of the DWLS estimator, which is suitable for ordinal items constructed scales, and is an effective tool for evaluating the dimensionality and psychometric properties of the scale in the following two reasons. The scales as a latent construct is estimated by Likert scale items consisting of ordinal data, and the DWLS method is regarded as having a less biased and more optimal fit (DiStefano and Morgan, 2014; Li, 2016; Lionetti et al., 2016). The model fit and cut-off criteria were evaluated on the basis of the following cut-off values; a comparative fit index (CFI) and a Tucker-Lewis fit index (TLI) of over 0.950, a standardized root mean square residual (SRMR) under 0.08 and an root mean square error of approximation (RMSEA) under 0.06, which were considered good fits (Hair, 2010; Bass et al., 2016). An acceptable model can also be indicated by $\chi^2/df \leq 3$ due to the large sample size (Kline, 2005).

The analyses were implemented with the IBM SPSS 25.0 and the lavaan package version 0.6-3 (Rosseel, 2012) in R versio **Statistical Methods:**

The researcher could determine the statistical methods used to address the study hypotheses in the light of several variables, including:
1. The size of the sample.
2. The scales used.
3. The type of the hypotheses.

The results of the study include addressing the assumptions and discussing their results in the light of the previous studies and the convergences and differences with their results, as follows:

١- **There are statistically significant differences between the mean research sample scores of both genders on the measure of ego depletion.**

To verify the validity of this hypothesis, the responses of the study sample (n = 400) on the ego depletion scale were statisticaly processed using the t-test for independent samples, and the result was as follows *(Table 9):*

Table (9) The value of (T) to indicate the differences between males and females regarding the dependent variable :ego-depletion

Statistical values / Ind.variable	gender	(N)	(Mean)	(SD)	(T)	(Sig.)
Ego-depletion	Males	188	64.96	3.69	5.091	0.000**
	Females	212	69.42	5.83		

(**)statistically significant at the significance level (0.01) and the two-tailed distribution

reading the quantitative reading of the previous table (9), it becomes clear that the value (T) of the significance of the differences between the average performance of male and female university students on the scale of ego depletion is 5.091) with a level of significance (0.000) which is less than (0.05) i.e. 95% confidence, and 5% doubt) if it is significant Statistically, it is possible to accept the alternative hypothesis that says: Ego depletion varies according to gender, and the null hypothesis is rejected, meaning that there are statistically significant differences at the level of significance (0.01) between male and female university students in the ego depletion .

2- The independent variables: (self-control, self-regulation, procrastination) have a predictive ability to explain the percentage of

change in the dependent variable: (ego depletion) among university students.

Multiple regression analysis was used to answer this hypothesis. Through multiple regression analysis, the relationship between a dependent variable and several independent variables can be investigated, and a model can be built for the size of the influence of the independent variables on the dependent variable, and it also evaluates the size of the contribution of each of the independent variables entered in the model (Pallant, 2011). The following is a presentation of the procedures for applying multiple regression analysis. It is possible to present a complete picture of the extent of the contribution of the independent variable: self-control - self-regulation - procrastination) in explaining the variance in the dependent variable (self-depletion) .

The multiple regression analysis includes the following steps (Pallant, 2011):

Verify the conditions that must be met for the application of regression analysis: Several precautions were taken to ensure that the data fit the assumptions of the regression analysis and match its conditions. The correct use of multiple regression analysis requires the fulfillment of several conditions so that the model can be applied and to ensure its credibility, and (Pallant,2011) mentions that multiple regression analysis is one of the complex statistical methods whose conditions are difficult to achieve, and it is not permissible to use it in the absence of all the conditions that must be met in the data.

1- **Sample size**: The researchers assume different guidelines for determining the appropriate sample size for applying regression analysis. Stevens (Stevens, 1996, p;72) believes that in the social sciences, it requires the presence of 15 individuals for each independent variable, in order to obtain a reliable equation. Taking into account the number of independent variables ($n < 50 + 8 \times m$), where m = the number of independent variables, the scales were applied to a sample of (400) university students, with an average of (133.33) students for each of the independent variables.

2- **Correlation coefficients between research variables:** Correlation coefficients between research variables were conducted, with the aim of determining the strength and direction of the relationship. The following table shows the correlation coefficients between the dependent variables in the ego depletion:

Table (10) Correlation coefficients between variables in ego depletion

Variables	Ego depletion		
	Self-control	Self-regulation	Procrastination
Self-control	0.31*	0.43**	1.00
Self-regulation	0.35*	1.00	0.51**
procrastination	1.00	0.36*	0.25*

*statistically significant at the level (0.05), ** statistically significant at the level (0.01)

It is clear from table(10) that the relationship between the independent variables in the ego depletion ranges from the presence of statistically significant with a slight percentage.

Multi collonearity: Multilinearity refers to a strong correlation between the independent variables, that is, the relationship between the variables is greater than or equal to (7.0), and in the case of a strong relationship between two variables, one of them must be deleted or a composite variable must be formed from the results These two variables (Pallant, 2011). Accordingly, it is recommended that there should be no n 3.5.2.

3- strong significant correlations between the independent variables to perform the regression analysis. It has been confirmed that there is no strong correlation between any of the independent variables using the Variance Inflation Factory (VIF) and the Tolerance Factor for each of the variables. The value of the permissible variance is very small, i.e., less than (1.0), this indicates a strong correlation between the variables, while if the value of the variance inflation factor is greater than (10), this indicates a strong correlation between the variables (Pallant, 2011). Accordingly, it is recommended that there should be no strong significant correlations between the independent variables to perform the regression analysis. It has been confirmed that there is no strong correlation between any of the independent variables using the Variance Inflation Factory (VIF) and the Tolerance Factor for each of the variables. The value of the permissible variance is very small, i.e., less than (1.0), this indicates a strong correlation between the variables, while if the value of the variance inflation factor is greater than (10), this indicates a strong correlation between the variables (Pallant, 2011). The following table shows the values of the variance inflation coefficients and the permissible variance for each of the independent variables in ego depletion.

Table (11) values of the coefficients of variance inflation and the permissible variance for each of the independent variables on ego depletion

Independent Variables	Ego depletion	
	Variance Tolerance Factor	Variance Inflation Factory
Self-control	0.82	1.21
Self-regulation	0.٧2	1.22
Procrastination	0.٥١	1.53

By reading the quantitative reading of the statistical treatment in the previous table (11), we conclude that all values of the coefficient of variation inflation are less than (10), and that all values of the coefficient of variation are greater than (0.1) on the depletion of the ego, as it appears from the correlation matrix that all the values of the correlation coefficients between any of the independent variables did not exceed (0.7), which negates the existence of a strong correlation between any of the independent variables on the ego depletion, so no variable will be deleted .

4- **That one of the independent variables not be the sum of some other independent variables (Singularity):** One of the independent variables included in the model must not include any of the other independent variables, for example when the scores of the sub-scales are entered with the total score of a measure (Pallant, 2011). By reviewing the variables of this study and the nature of each of them, it was confirmed that the independent research variables do not include any of the other independent variables.

5- **Outliers**: are those cases whose scores are clearly different from the rest of the sample scores, either less than or significantly greater than the rest of the scores (Pallant, 2011), and to find out whether those extreme values have a strong impact on the sample mean as a whole, the sample mean is compared As a whole with the sample average omitted from it above 5% and below 5% of the scores, if there are clear differences between the two averages, this indicates that those values may have an impact on the average. The following table shows the average of the sample as a whole and the sample average omitted from it, the highest 5% and the lower 5 % of scores for each of the variables in ego depletion.

Table (١٢) The mean of the sample as a whole and the mean of the sample omitted from it, the highest 5% and the lowest 5% of the scores for each of the variables on ego depletion

Variables	Ego depletion	
	The mean, from which outliers are omitted	The mean of the sample as a whole
Self-control	11.71	11.68
Self-regulation	43.8	43.63
procrastination	1.7	1.94

It is clear from table(12) that there are no significant differences between the average of the sample as a whole and the average of the sample, omitting the extreme values of the highest 5% and the lowest 5% of the scores for each of the variables on ego depletion.

As it appears from the processors provided by SPSS that the upper limit of the value of (Distance ' Cook) in ego depletion (0.098), it did not exceed the correct one in ego depletion, which indicates that outliers do not have a significant impact on the results.

6- **Equilibrium, linearity, homogeneity of variance and independence:**
This hypothesis is confirmed by the graphs provided by the SPSS program. The following figures show the Normal p-Plot of Regression Standardized Residual and the Scatterplot.
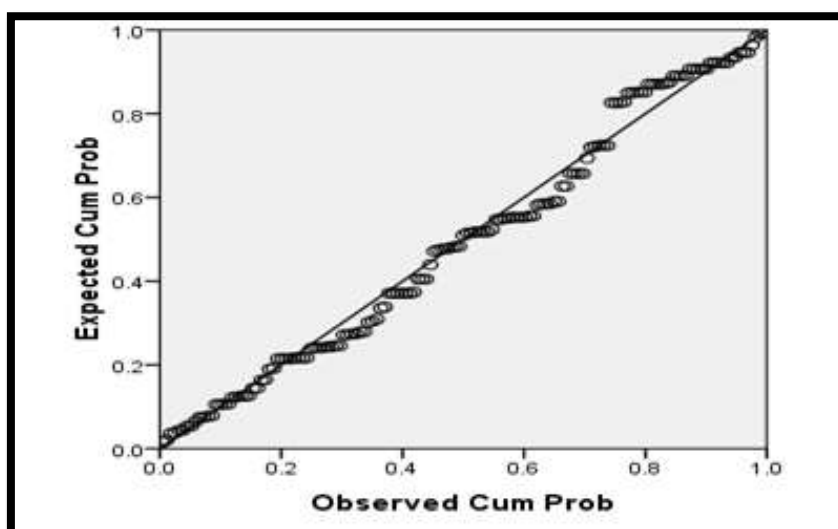

Figure (1) The normal probability chart for the standard residuals in ego depletion
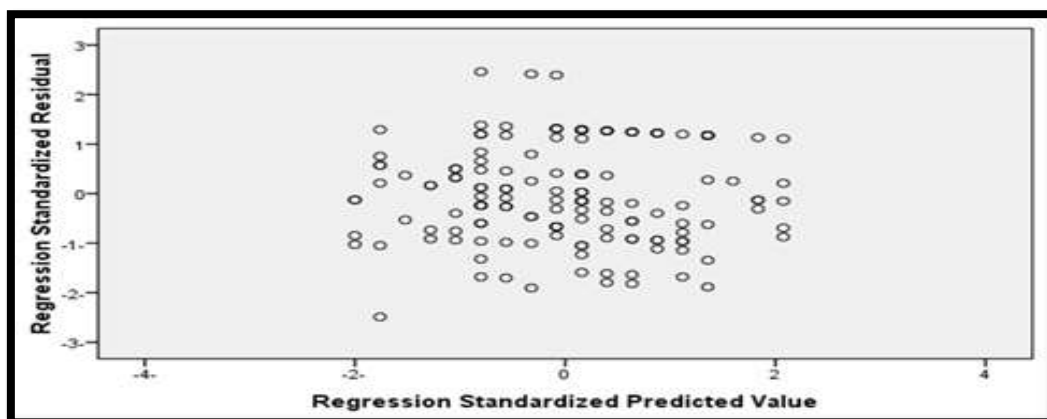
Figure (2) Diffusion diagram of the standard residuals in the depletion of ego depletion

It is clear from graph(1)&(2) the linear relationship, the homogeneity of variance and the independence of the residuals, as the shape of the normal probability planning is diagonal, and the scattering plot is semi-rectangular, most of the points are gathered in the middle around the zero, so the data is distributed according to the normal distribution, which indicates the availability of the analysis hypotheses in general.

Table (13) shows the linear correlation factor between the variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.823[a]	.677	.675	2.35344

This model multiple linear regression model, with three explanatory variables, now has an R squared value of 0.675. 67.5 % of the variation in % ego depletion can be explained by this model.

Table (14) shows the statistical significant of the whole model

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11598.023	4	2899.506	523.501	.000[a]
	Residual	5544.221	1001	5.539		
	Total	17142.244	1005			

Once again, the model, as a whole, is a significant fit to the data. From the previous table, we deduce the interpretive strength of the model as a whole through the value (F) = (523.501), at a indicative level = (0.011), which is less than > 0.05), which makes us confident that the model is statistically

acceptable, and the result can be generalized to the rest of the sample community.

Table (15) (T) Value for predicting ego depletion through self-control, self-regulation & procrastination

		B	Std. error	Beta	t	Sig.
Constante		-9.832	2.734		-3.596	.000
Study Variables	%Self-control	0.774	0.035	0.664	22.147	.000
	%Self-regulation	0.344	0.056	0.121	6.176	.000
	%Procrastination	0.052	0.009	0.175	5.728	.000

(.000) = statistically significant at the level of significance (0.01) and the two-tailed distribution

From the tables above(13,14&15) the researcher see that:

- All the explanatory variables are statistically significant.

- All have positive coefficients – for each explanatory variable a greater percentage is associated with a higher level of ego depletion.

- Given the value of (t) to see how the independent variable is indicative and its contribution to predicting the dependent variable, the researcher found that the indication (t) = (0.011), which is less than > 0.05), so the independent variable. can predict the dependent variable.

Discussion and Analysis:

On dealing with the issue of the effect of ego-depletion on both age and gender ,(Da Silva et al , 2019) replicate the finding that females perform better than males in the task switching type of multitasking. This study also find that multitasking impairs cognitive reflection through ego depletion, regardless of gender. However, the cognitive reflection of males is relatively more weakened after multitasking. This suggests that ego depletion may be an interesting candidate mechanism to explain gender differences in multitasking performance. According to (Wang L, et al (2015) women have been found to experience decreased self-control during premenstrual syndrome, as the ovaries work harder during this phase of menstruation and older people may be more resistant to ego depletion than their younger counterparts.

The results, which showed that ego depletion can be influenced by the participants' self-control, self-regulation, and procrastination levels, this

supported the second hypothesis. the finding that showed that ego-depleted participants showed lower behavioral intention to complete the procedures filling in the scales, was consistent with previous results regarding the aftereffect of ego depletion (e.g., Vohs et al., 2012). This implied that if they exerted self-control and self-regulation continuously, they showed decreased performance in demanding tasks.

Individuals are prone to conserve energy or effort, which guides their self-regulation (Baumeister et al., 1998), and when they feel depleted, they prefer passive behavior rather than active and effortful activity (Vonasch, Vohs, Pocheptsova Ghosh, & Baumeister, 2017). Self-control, however, moderates the negative aftereffect of ego depletion by encouraging individuals to engage in effortful activity in demanding situations, and to suspend mental passivity.

Theoretical, Educational and Practical Implications:

The results of this study have several practical implications. For example, parents, lecturers, and administrators need to encourage students to reflect on their efforts and on the meaning of achieving to facilitate their education phases, because the institutional context affects the construction of a student-based identity (Vandenabeele, 2007). Senior students in public educational organizations also need to develop relevant educational programs and provide positive feedback to satisfy students' three basic needs (autonomy, competence, and relatedness) as proposed in the self-determination theory (Andrews, 2016).

The results also implies that subsequent self-control, self-regulation, and procrastination performance will deteriorate when there is ego depletion is also important for students. As self-control deficits are linked to burnout and poor job performance (Hunt & Madhyastha, 2012), administrators need to arrange study schedules to ensure that students have sufficient strength to fight against ego depletion. Students themselves should always regulate themselves to work in a nondepleted condition.

Limitations and Directions for Future Research:

Through the study, the attempt to understand and delve deeper into the problem over a period of time, as well as a careful reading of the empirical circumstances in other researches to try to understand other experimental conditions and to analyze carefully and reviewing the results of previous studies, some recommendations can be made procedurally as follows , and fact that the

researcher studies a particular problem does not mean at all that he has examined all its aspects, but rather he has completed a stage and several stages remain directly or indirectly related to the research problem. On this basis, the following research can be proposed to gain more insight and understanding of the study variables.

There are several limitations in this study. First, although the results show that self-control, self-regulation, and procrastination are significantly predict the changes in the level of ego depletion, the researcher cannot conclude that there is a direct relationship between the variables of the study. An unrecognized third factor may covariate with these factors. For example, people with high (vs. low) level of self-control may be more likely to perform a high level of self-monitoring. Thus, the relationship between self-regulation and self-control remains open to debate. The reason for not assuming that there are fundamental differences between the gender in self-control, self-regulation and procrastination can be explained by the inequality of some demographic variables among the sample members, given that the method of selecting the participant was random from different classes such as: (economic and social level, lifestyle, psychological and health status of the individual) ,on this basis of which the researcher assumed the low probability of a discrepancy between males and females in the independent variable (ego depletion) .

As the descriptive design also limits the scope of prediction, future researchers need to integrate both cross-sectional and experimental designs. Future researchers can also include additional work-related tasks to determine the degree to which students deplete their resources, and to what extent other variables such as: <u>selective attention, attention draining , attention control , cognitive load ,working memory and emotional agility</u> counteracts the detrimental effects of ego depletion.

Third, because of cost considerations, the sample size was not too large, and this may have resulted in sampling bias. The participants, who were university students from both gender, were not equal on their economic – social level and their IQ level. Therefore, future researchers should diversify the sample and make sure to spot the extraneous variables. The researcher could also suggest these recommendations:

1. Establishment of psychological counseling centers to include qualified and experienced people who can provide psychological services and help raise the efficiency of female students and their abilities to acquire knowledge.

2. To hold seminars to draw interest in cognitive and educational psychology research.

3. Designing workshops to develop awareness that there are many variables (social status, economic status, level of education, levels of educational service provided to the student) that are positively and negatively related to the study variables as one of the aspects of educational psychology, which did not take their amount from the research.

4. Holding courses to integrate counseling techniques as well as applying learning theories within the educational classrooms, because of this of the benefit and a good impact on the students.

5. Designing media programs to activate the role of the psychologist inside schools to listen to students' problems and to advance the learning process.

In conclusion, the researcher confirmed the aftereffect of ego depletion on subsequent self-control, self-regulation, and procrastination. Also, the confirmation of the effect of (age and gender) on ego depletion level. The research suggest that ego depletion can be changed over time and influenced by the educational context, where it can be targeted and heightened, and students can effectively regulate themselves in demanding self-control situations and can enhance their academic performance through refuting procrastination.

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ضبط الذات ، التنظيم الذاتي والتلكؤ كمنبئات نفسية لنضوب الأنا لدى طلبة الجامعة

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الملخص

تهدف هذه الدراسة إلى تناول مفهوم نضوب الأنا وتأثير كلاً من النوع والعمر لدى عينة من طلبة الجامعة. كما تقترح الدراسة أنه عندما يحدث النضوب، فإن هذه العملية تعتمد على تأثير ضبط الذات والتنظيم الذاتي والتلكؤ على الشخص. تتبع الدراسة المنهج الوصفي. تكونت عينة البحث (عينة تشخيصية وصفية) من (ن = ٤٠٠) طالب وطالبة جامعيين تتراوح أعمارهم بين (٢١-١٨) سنة. تم تطبيق مقاييس لتشخيص المتغيرات الدينامية (نضوب الأنا، ضبط الذات، التنظيم الذاتي، التلكؤ) ـ من إعداد الباحثـ، وتم توضيح أهم مكونات هذه المقاييس في ضوء ما تم الكشف عنه من دراسات ونماذج مفسرة وتعريفات سابقة. أما بالنسبة للطرق الإحصائية، فقد استطاعت الباحثة تحديد الأساليب الإحصائية المستخدمة في تناول فروض الدراسة في ضوء عدة متغيرات منها: حجم العينة، والمقاييس المستخدمة، ونوع الفروض. تم استخدام معادلة الانحدار الخطي المتعدد لاكتشاف مدى إسهام وتأثير المتغيرات المستقلة (ضبط الذات، التنظيم الذاتي، التلكؤ) والقدرة على التنبؤ بالتغييرات المحتملة على مستوى المتغير التابع (نضوب الأنا).

أظهرت النتائج وجود علاقة ارتباطية ذات دلالة إحصائية بين متوسطات درجات المتغير الديموغرافي (العمر) على مقياس نضوب الأنا لصالح (العمر) بين (٢١-١٩) سنة. كما كشف البحث عن فروق ذات دلالة إحصائية بين متوسطي درجات الذكور والإناث (النوع) على مقياس نضوب الأنا لصالح الذكور. كشفت الدراسة أيضًا عن ارتباطات ذات دلالة إحصائية بين نضوب الأنا (متغير تابع) وضبط الذات، والتنظيم الذاتي، والتلكؤ (المتغيرات المستقلة) كتمهيد لإثبات أن المتغيرات المستقلة تسهم في التنبؤ بالتغير الحاصل في مستوى المتغير التابع.

الكلمات المفتاحية: (نضوب الأنا ، ضبط الذات، التنظيم الذاتي ، التلكؤ، تحليل الانحدار المتعدد)