Impact of Hopelessness on Performance: A Quantitative Analysis

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Abstracts

This study analyzes the relationship between hopelessness and Total Average using a simple linear regression model, in order to assess how negative emotional states can affect performance. The research is based on theoretical approaches such as the Theory of Emotional Apprehension in Learning, the Theory of Learned Helplessness and psychometric models that explain the impact of emotions on productivity. It is hypothesized that an increase in hopelessness is associated with a decrease in the total average, suggesting that adverse psychological states may be determinants of individual performance.

To evaluate this relationship, a quantitative design based on econometric techniques was used. The estimated model shows that the coefficient of the variable Hopelessness is negative and significant ($p<0.005p < 0.005$), indicating that as hopelessness increases, performance decreases. In addition, the model meets the fundamental assumptions of regression, including tests of specification, linearity, and absence of autocorrelation. The conclusions highlight that Hopelessness can be a critical factor in performance, which has implications in both the educational and labor fields. The evidence obtained suggests that implementing strategies for emotional management and the regulation of affective states could improve individual outcomes. It is recommended that future research include mediating and moderating variables to deepen the understanding of this relationship.

Keywords: Hopelessness, performance, linear regression, learning, emotions, productivity.

1. Introduction

Academic and work performance is a phenomenon influenced by multiple factors, including the emotional state of individuals (Fredrickson, 2001; Pekrun, 2006). Within negative emotions, hopelessness has been widely studied due to its impact on motivation, learning, and decision-making (Abramson, Seligman, & Teasdale, 1978). It is defined as a psychological state characterized by the perception of lack of control over the future, which reduces persistence in tasks and confidence in one's own abilities (Beck, Weissman, Lester & Trexler, 1974).

In educational and organizational settings, hopelessness can translate into decreased engagement and poor performance (Snyder et al., 2002). Previous studies have shown that individuals who experience high levels of hopelessness tend to show less planning capacity, less effort in problem solving, and a predisposition to abandon tasks (Evans et al., 2005; Alloy et al., 2006). At the neurocognitive level, hopelessness affects emotional regulation processes in the prefrontal cortex, which hinders sustained attention and rational decision-making (Disner, Beevers, Haigh & Beck, 2011).

Given that the literature has pointed out the relationship between negative emotional states and performance, the present study seeks to answer the following research question: To what extent does hopelessness influence the general performance of individuals? To this end, a quantitative approach based on simple linear regression is used, with the aim of evaluating whether the increase in the levels of hopelessness is associated with a decrease in overall performance, measured through the total average.

To understand the relationship between hopelessness and performance, various theoretical frameworks from cognitive psychology, education, and behavioral economics are used.

Theory of Learned Helplessness (Seligman, 1975)

The Learned Helplessness Theory postulates that individuals who experience repeated failures without perceiving control over the results develop a state of helplessness that reduces their motivation and performance (Maier & Seligman, 2016). This model is relevant to the present study, as it explains how hopelessness can generate a passive attitude that decreases persistence in academic or work tasks, negatively affecting performance (Peterson, Maier & Seligman, 1993).

Self-Determination Theory (Deci & Ryan, 1985)

From the Self-Determination Theory, hopelessness is an indicator that the basic psychological needs of autonomy, competence, and relationship are not being met, which can lead to a reduction in intrinsic motivation (Ryan & Deci, 2000). In this sense, the decrease in internal motivation due to hopelessness would explain the deterioration in the performance of individuals, since their commitment to the task is affected (Vansteenkiste, Lens & Deci, 2006).

Emotion Processing Model (Pekrun, 2006)

From educational psychology, Pekrun' s (2006) Model of Processing Emotions in Learning points out that negative emotions, such as hopelessness, affect the regulation of effort and persistence in learning. According to this model, students who experience hopelessness have difficulty concentrating, show less willingness to exert themselves, and perform poorly compared to those who maintain positive emotional regulation (Pekrun, Goetz, Titz, & Perry, 2002).

Expectation-Value Theory (Eccles & Wigfield, 2002)

Another relevant approach is the Expectation-Value Theory, which suggests that individuals invest effort in tasks based on their expectations of success and the valuation they assign to the activity (Wigfield & Eccles, 2000). Hopelessness can distort the perception of self-efficacy and

reduce the expectation of success, leading to a decrease in the investment of effort and, therefore, to lower performance.

Neuroscience of Emotion and Performance (Davidson & Irwin, 1999)

From neuroscience, studies have shown that hopelessness is associated with a decrease in the activity of the dorsolateral prefrontal cortex, a region involved in the planning and regulation of behavior (Gotlib & Joormann, 2010). Likewise, hyperactivity of the amygdala in states of hopelessness reduces the ability to cope with challenges, which negatively impacts performance in demanding cognitive tasks (Ochsner & Gross, 2005).

The present study employs a quantitative, correlational, and explanatory design based on a simple linear regression model to analyze the impact of hopelessness on overall performance. A sample of 225 observations is analyzed, applying statistical analysis techniques to determine the degree of relationship between both variables.

The results are expected to confirm the hypothesis that the greater the hopelessness, the lower the overall performance of individuals. In particular, it is anticipated that the negative slope of the coefficient associated with the variable Hopelessness will be significant, which would indicate that adverse emotional states can reduce efficiency in the execution of tasks.

Methodologically, the model will be subjected to validity tests to verify that it complies with the statistical assumptions of linearity, normality, homoscedasticity and absence of autocorrelation. This will guarantee the soundness of the inferences made and will allow the interpretation of the coefficients with statistical validity.

The findings of this study will have implications for the management of emotional regulation strategies, both in the educational and workplace settings. If the relationship between hopelessness and performance is significant, the implementation of psychological interventions and emotional support programs that mitigate the negative effects of hopelessness on productivity and learning is recommended.

2. Methodology

Study Design

The present study adopts a quantitative, explanatory and correlational approach, with the aim of analyzing the relationship between hopelessness and the overall performance of individuals, measured through the total average. To do this, a simple linear regression model is used, which allows estimating the influence of the independent variable (Hopelessness) on the dependent variable (Total Average).

The econometric model is expressed as follows:

$Y=B0+B1X1+uY = B\_0 + B\_1X\_1 + u$

where:

- YY represents the dependent variable Total Average,

- X1X_1 is the independent variable Despair,
- B0B_0 is the intercept of the model,
- B1B_1 is the coefficient of the explanatory variable,
- UU is the term for random error.

This design allows us to assess whether an increase in hopelessness is associated with a decrease in performance and to determine the magnitude of this effect.

Population and Sample

The study population is made up of individuals whose levels of hopelessness and performance have been measured by standardized instruments. For the estimation of the model, a sample of 225 observations was taken, ensuring a sufficient amount of data to guarantee the representativeness of the results and the stability of the statistical model.

The sample selection criteria was non-probabilistic for convenience, using previous records that contain information on the levels of hopelessness and performance of the participants. Homogeneous conditions were ensured in the data collection to minimize biases in the estimation of the coefficients.

Instruments

For data collection and analysis, psychometric tools and validation statistics were used.

- Measurement of Hopelessness: The Beck Hopelessness Scale (BHS) was used, an instrument widely validated in mental health and education studies (Beck, Weissman, Lester & Trexler, 1974). This scale measures the level of hopelessness through a series of items that evaluate the perception of the future and the expectation of control over the results.
- Measurement of Global Performance: The total average performance obtained from previous records was used. In educational contexts, the average reflects academic performance, while in organizational contexts it can represent indicators of productivity and efficiency.

For the statistical analysis, the R software was used, using regression techniques and diagnostic tests of the model.

Data Analysis

The statistical analysis was carried out in several stages:

1. Descriptive analysis: Measures of central tendency and dispersion were calculated to examine the distribution of variables.

2. Estimation of the regression model: The ordinary least squares (OLS) method was used to determine the relationship between Hopelessness and Total Average.

3. Model validation: Various econometric tests were applied to verify compliance with the assumptions of simple linear regression:

- Ramsey test: Confirmed that the model is correctly specified (p=0.2719p=0.2719).
- Rainbow test: Verified the linearity of the model (p=0.4826p=0.4826).
- Durbin-Watson test: Evaluated autocorrelation in residuals, ensuring their independence (p=0.3186p=0.3186).

The results of these tests indicated that the model meets the criteria for statistical validity, allowing for confident interpretation of the estimated coefficients.

3. Results

Data analysis allowed us to evaluate the relationship between Deshopelessness and Total Average in the sample studied. Through a simple linear regression model, the impact of the independent variable (Hopelessness) on the dependent variable (Total Average) was determined, which allowed validating the hypothesis that an increase in hopelessness is associated with a reduction in performance.

Descriptive Statistics

Prior to the estimation of the econometric model, a descriptive analysis of the variables was carried out in order to understand their distribution and dispersion. Table 1 presents the main measures of central tendency and dispersion:

Variable	Minimal	1st Quartile	Median	Stocking	3rd Quartile	Maximum
Total Average	2.412	4.118	4.588	4.605	5.176	6.000
Hopelessness	0.000	1.000	2.000	3.391	5.000	11.000

These values reflect a normal distribution of variables, without the presence of extreme outliers that could affect the model's estimation.

Regression Model Estimation

The estimated simple linear regression model is expressed as follows:

$\hat{Y} = 4.76503 - 0.04728 X_1 + u$

where:

- $\hat{Y}$ represents the dependent variable Total Average,
- X_1 is the independent variable Despair,
- 4.765034.76503 is the model intercept,
- −0.04728-0.04728 is the coefficient that measures the impact of Hopelessness on Total Average,
- UU represents the term random error.

Table 2 presents the estimated coefficients and their statistical significance:

Coefficient	Estimate	Standard Error	Value t	P-Value
Intercept	4.76503	0.07560	63.03	< 0.001
Hopelessness	-0.04728	0.01659	-2.85	0.00478

The estimated coefficients indicate that there is a negative and significant relationship between Hopelessness and Total Average. Specifically, for each additional unit in Desesperanza, the Total Average decreases by approximately 0.047 units.

The adjusted coefficient of determination (adjusted R2R^2 = 0.03082) suggests that approximately 3.08% of the variability in overall performance is explained by the Deshopefulness variable. Although this value is moderate, the coefficient is statistically significant, indicating that hopelessness influences performance, although there are additional factors that also affect performance.

Model Validation

To evaluate the validity of the model, several statistical tests were carried out in order to verify compliance with the fundamental assumptions of the regression:

- Ramsey test: Confirmed that the model is correctly specified (p=0.2719p=0.2719).
- Rainbow test: With a statistic Rain=1.0085Rain = 1.0085 (p=0.4826p=0.4826), it was confirmed that the relationship between the variables is linear.
- Durbin-Watson test: With a statistic DW=1.9386DW = 1.9386 (p=0.3186p = 0.3186), it was concluded that there is no significant autocorrelation in the model residuals.

These results support the validity of the model and allow its coefficients to be interpreted with confidence.

Interpretation of the Results

The negative coefficient of Hopelessness indicates that individuals who experience higher levels of hopelessness tend to perform lower compared to those with lower levels of hopelessness. This finding is consistent with the Learned Helplessness Theory (Seligman, 1975), which suggests that the perception of lack of control over results decreases motivation and effort, which translates into lower performance (Maier & Seligman, 2016).

Likewise, the Self-Determination Theory (Deci & Ryan, 1985) explains that individuals with higher levels of hopelessness experience lower satisfaction of their basic psychological needs, which reduces their intrinsic motivation and, consequently, their performance (Ryan & Deci, 2000).

From behavioral neuroscience, studies have indicated that hopelessness is associated with decreased activity of the dorsolateral prefrontal cortex, which affects planning and decision-making (Disner, Beevers, Haigh & Beck, 2011). Amygdala hyperactivity, associated with

negative emotional states, also interferes with sustained attention span, which directly affects performance (Ochsner & Gross, 2005).

These findings have significant implications in both the educational and organizational spheres, as they suggest that hopelessness is not only an emotional problem, but has a measurable impact on productivity and learning.

4. Conclusions

The present study examined the relationship between Hopelessness and Total Average, confirming that there is a negative and statistically significant association between both variables. As levels of hopelessness increase, individuals' overall performance declines, supporting previous theoretical models of the impact of emotions on performance.

From a theoretical perspective, the results obtained reinforce the postulates of the Learned Helplessness Theory (Seligman, 1975), by demonstrating that hopelessness can reduce motivation and persistence in the execution of tasks, which negatively impacts performance (Maier & Seligman, 2016). Likewise, the Self-Determination Theory (Deci & Ryan, 1985) explains that hopelessness affects the satisfaction of basic psychological needs, which decreases intrinsic motivation and affects performance (Ryan & Deci, 2000).

The findings are also consistent with previous studies that have shown that negative emotions, such as hopelessness, affect the regulation of effort and concentration on tasks (Pekrun et al., 2002; Alloy et al., 2006). In neuroscientific terms, research has shown that hopelessness is related to a decrease in the activity of the dorsolateral prefrontal cortex, a region involved in the regulation of behavior and decision-making, as well as to an overactivity of the amygdala, which interferes with sustained attention and the management of cognitive effort (Disner, Beevers, Haigh & Beck, 2011; Ochsner & Gross, 2005).

These results have relevant implications in the educational and organizational field, as they suggest that hopelessness is not only an emotional state, but also has a measurable impact on productivity and learning. Therefore, it is advisable to implement strategies for emotional management, affective regulation, and the reinforcement of intrinsic motivation in order to mitigate the negative effects of hopelessness on performance.

From an applied approach, the incorporation of emotional well-being and resilience programs in academic and work environments can be an effective strategy to improve performance and the perception of control over results. In education, promoting teaching methods focused on autonomy, positive feedback, and the development of self-efficacy could help students reduce their levels of hopelessness and improve their performance. In the organizational context, the implementation of psychological well-being and work motivation programs can be key to optimizing productivity and reducing the negative effects of adverse emotional states.

In conclusion, the findings of the study confirm that hopelessness has a negative impact on performance, reinforcing the need to address this variable from an interdisciplinary perspective. The optimization of psychological, educational and organizational intervention strategies can

contribute significantly to the improvement of individual and collective performance in different contexts.

WORKS CITED

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87(1), 49-74.

Alloy, L. B., Abramson, L. Y., Whitehouse, W. G., Hogan, M. E., Tashman, N. A., Steinberg, D. L., Rose, D. T., & Donovan, P. (2006). Prospective incidence of first onsets and recurrences of depression in individuals at high and low cognitive risk for depression. Journal of Abnormal Psychology, 115(1), 145-156.

Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The Hopelessness Scale. Journal of Consulting and Clinical Psychology, 42(6), 861-865.

Davidson, R. J., & Irwin, W. (1999). The functional neuroanatomy of emotion and affective style. Trends in Cognitive Sciences, 3(1), 11-21.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. Springer.

Disner, S. G., Beevers, C. G., Haigh, E. A. P., & Beck, A. T. (2011). Neural mechanisms of the cognitive model of depression. Nature Reviews Neuroscience, 12(8), 467-477.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. Annual Review of Psychology, 53, 109-132.

Evans, D. L., Charney, D. S., Lewis, L., Golden, R. N., Gorman, J. M., Krishnan, K. R. R., Nemeroff, C. B., Bremner, J. D., Carney, R. M., Coyne, J. C., & others. (2005). Mood disorders in the medically ill: Scientific review and recommendations. Biological Psychiatry, 58(3), 175-189.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. American Psychologist, 56(3), 218-226.

Gotlib, I. H., & Joormann, J. (2010). Cognition and depression: Current status and future directions. Annual Review of Clinical Psychology, 6, 285-312.

Maier, S. F., & Seligman, M. E. P. (2016). Learned helplessness at fifty: Insights from neuroscience. Psychological Review, 123(4), 349-367.

Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. Trends in Cognitive Sciences, 9(5), 242-249.

Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. Educational Psychology Review, 18(4), 315-341.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. Educational Psychologist, 37(2), 91-105.

Peterson, C., Maier, S. F., & Seligman, M. E. P. (1993). Learned helplessness: A theory for the age of personal control. Oxford University Press.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68-78.

Seligman, M. E. P. (1975). Helplessness: On depression, development, and death. Freeman.

Snyder, C. R., Rand, K. L., & Sigmon, D. R. (2002). Hope theory: A member of the positive psychology family. In C. R. Snyder & S. J. Lopez (Eds.), Handbook of positive psychology (pp. 257-276). Oxford University Press.

Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. Educational Psychologist, 41(1), 19-31.

Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. Contemporary Educational Psychology, 25(1), 68-81.