

# RELATIONSHIP BETWEEN THE SELF-EFFICACY AND THE STAGES OF THE DECISION-MAKING PROCESS: ANALYSIS OF THE FUTURE MANAGERS' PERCEPTION

## *RELAÇÃO ENTRE A AUTOEFICÁCIA E OS ESTÁGIOS DO PROCESSO DECISÓRIO: ANÁLISE DA PERCEPÇÃO DOS FUTUROS ADMINISTRADORES*

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## ABSTRACT

**Purpose** – This study analyzes the relationship between self-efficacy and the stages of the decision-making process, based on the perception of the undergraduate students in bachelor degree in Business Administration.

**Design/methodology/approach** – It characterizes as a descriptive research, with a quantitative approach, using the Structural Equation Modeling technique, and data collection performed through a survey.

**Findings** – The results indicate an association between self-efficacy and the stages of the decision-making process, allowing partial acceptance of the research hypothesis. In this sense, Effectiveness towards Adversity and Social Efficacy are shown as elements to be observed in terms of developing skills, which enable the students to realize such constructs, since there is a significant relationship with behavior in the decision making process. Thus, self-efficacy is presented as a propeller of the individual's confidence in the challenges and experiences with interpersonal relationships, whose experience supports the cognitive process which enables the recognition of the situation and the actions to be developed. Moreover, it is worth noticing the relevance of considering behavioral aspects in decision-making studies; regarding to, as well, the current discussions about the limitations of rational decision models.

**Research limitations/implications** – The cross-section time frame and the sample composition of academics at a university are limitations that can be overcome in the future.

**Originality/value** - Analyzing the relationship of self-efficacy with the stages of the decision-making process becomes relevant, since it brings contributions on the relationship of subjective abilities with decision making, in order to highlight characteristics not covered by rational decision-making models.

**Keywords:** Self-efficacy, Decisional Process, Administration.



## RESUMO

**Objetivo** – Este estudo analisa a relação existente entre a autoeficácia e os estágios do processo decisório, a partir da percepção dos acadêmicos do curso de Bacharelado em Administração

**Metodologia** – A pesquisa caracteriza-se como descritiva, com abordagem quantitativa, com a técnica de Modelagem de Equações Estruturais e coleta de dados realizada por meio de survey.

**Resultados** – Os resultados indicaram associação entre a autoeficácia e os estágios do processo decisório, permitindo a aceitação parcial da hipótese de pesquisa. Nesse sentido, a Eficácia perante a Adversidade e a Eficácia Social mostram-se como elementos a serem observados, em termos de desenvolvimento de habilidades, que possibilitam aos estudantes perceber estes constructos, uma vez que há relação significativa com o comportamento destes perante o processo decisório. Dessa forma, a autoeficácia apresenta-se como propulsora da confiança do indivíduo frente aos desafios e às experiências com relações interpessoais, cuja vivência sustenta o processo cognitivo que possibilita o reconhecimento da situação e as ações a serem traçadas. Ademais, nota-se a relevância de se considerar aspectos comportamentais nos estudos sobre tomada de decisão, considerando-se também as atuais discussões a respeito das limitações dos modelos de decisão racionais.

**Limitações e implicações da pesquisa** – O recorte temporal cross-section e a composição amostral de acadêmicos de uma universidade são limitações que podem ser superadas futuramente.

**Originalidade/valor** – Analisar a relação da autoeficácia com os estágios do processo decisório torna-se relevante, uma vez traz contribuições sobre a relação de capacidades subjetivas com tomada de decisão, a fim de evidenciar características não abrangidas pelos modelos decisórios racionais.

**Palavras-chave:** Autoeficácia, Processo Decisório, Administração.

## 1 INTRODUCTION

Theories arising from classical currents indicate decisions are exercised in a context of fixed alternatives and in stable environments in which it is possible to predict, in a certain way, the consequences of each course of action (Simon, 1959; Silva, Roglio & Silva, 2010). However, when aspects related to the cognition and the perception of decision makers' are observed, the objective models become inadequate, since the subjectivity of human behavior is not neutralized in the decision-making process. Empirical and theoretical studies suggest that decision making goes beyond the simple expression of knowledge, skills and mechanical skills, not consisting of options directly exposed, but sought and thought from the context experienced and that differs between each individual (Simon, 1959; Schwartz, 2002; Silva *et al.*, 2010; Myburgh, Watson & Foxcroft, 2015).

Decision-making is a critical and an important process (Myburgh *et al.*, 2015), as it is based on this that the course of action is defined in several areas. The decision-making process has been approached under multiple approaches, whether in career choice (Germeijns, Luyckxa, Notelaersb, Goossens & Verschueren, 2012; Lent, Ezeofor, Morrison, Penn & Ireland, 2016), in consumer decisions (Reed, Mikels & Löckenhoff, 2012), in management decisions (Wood & Bandura, 1989; Myburgh *et al.*, 2015), entrepreneurial (Foerbes, 2005; Bryant, 2007) or in the theoretical scope (Kahneman, 2003), among others.

There are several factors already studied and linked to decision making (Reed *et al.*, 2012), however there are few investigations that consider self-efficacy in the decision-making process. Recent evidence indicates that in the cognitive sphere, the ways in which thoughts, learning, choices and emotional behaviors are approached based on the subject's experiences (Oliveira, Trassi, Inácio & Santos, 2016), self-efficacy is a basic element capable of relating to the posture adopted in the face of decisions (Myburgh *et al.*, 2015). In this context, the business environment is characterized by competing objectives and goals, pressure for results, overloads, absences and inaccuracies of information, in addition to human limitations in the face of complex problems. Thus, the motivational capacity for cognitive behavior in the search for demands, opportunities and solutions is important for the



performance of tasks (Schwartz, 2002; Myburgh *et al.*, 2015), with self-efficacy driving this motivation.

In this sense, self-efficacy is conceptualized as beliefs that consist of “[...] expectations that each person has to have the necessary skills to do everything necessary to achieve a certain result” (Coimbra, 2010, pp. 64-65). In addition, the perception of opportunities, confidence in the success, viability and potential of these opportunities are also associated to the concept of self-efficacy (Bryant, 2007). It is believed that the time and importance attributed to each stage of the decision-making process can be affected by this variable, as effort, perseverance and resilience, as well as behavioral patterns can be aligned with self-efficacy beliefs (Bandura, 2009; Myburgh *et al.*, 2015).

In the current context, decisions are made based on multiple conflicting criteria and objectives (Reis & Löbler, 2012), which foster the perspicacity in analyzing the individual’s behavior at each stage of the decision-making process. As far as Administration students are concerned, they must be prepared for the organizational decision-making process, since to “manage is to decide first of all” (Azevedo, 1967, p. 36), to exert influence on those who make up the organizational body (Simon, 1965).

At the university level, mapping self-efficacy and the stages of the decision-making process can assist in the development of disciplines and actions focused on the individual’s self-confidence and independence. Improving these elements at the university can promote the development of differentiated professionals capable of meeting the needs in the job market, since the capacities and behaviors presented at the university level tend to be externalized in the working environment (Meriac, 2012).

Thus, it becomes opportune to deepen the scientific findings on the topic discussed. In this context, the study investigates: what is the relationship between the perception of self-efficacy and the stages of the decision-making process? Thus, the objective of the research is to analyze the relationship between self-efficacy and the stages of the decision-making process from the perception of the students of the Bachelor of Business Administration course. The stages of the decision-making process are characterized in this study as the behavioral posture adopted when making decisions.

Engin and Vetschera (2017) state that research carried out with students in the business area is relevant, as their behavior regarding to their decision-making process tend to be similar to that of organizational managers. In addition, addressing the self-efficacy construct brings contributions on the relationship of subjective abilities with decision making, in order to highlight characteristics not covered by rational decision-making models.

In addition, verifying the elements that relate to the stages of the decision-making process is relevant as it is possible to identify the factors that have an effect on the subject’s behavior at each stage of the decision, whether from identifying the problem to implementing solutions.

## 2 THEORETICAL REFERENTIAL AND RESEARCH HYPOTHESIS

### 2.1 Self-efficacy

Self-efficacy is derived from the Social Cognitive Theory and is based on the premise that the subject is capable of rooting motivating beliefs that able to believe in capacity for success (Bryant, 2007; Coimbra, 2010). In this perspective, “people are contributors to their life circumstances, not just products of it” (Bandura, 2009, p. 179), as there is a tendency to prioritize the performance of tasks in which it is believed to have a high level of self-efficacy (Forbes, 2005). Self-efficacy beliefs are also associated to effort and perseverance time spent on a task, as well as with the way obstacles



are faced by the subjects (Myburgh *et al.*, 2015).

Thus, self-efficacy manifests itself in all areas of life, since its perception is “the result of the individual’s interaction to the environment, as a set of meanings about the effects of his own acts” (Wallauer, Luna & Costa, 2010, p. 70). Ribeiro (1995) categorized self-efficacy beliefs in three dimensions. The first refers to “initiation and persistence” which consists of the ability to initiate and complete a certain action or task. In this dimension, the individual’s ability to initiate new challenges and persist with the development of certain tasks is addressed.

The second is called “efficacy in the face of adversity”, which includes attitudes towards challenges and adverse situations that may interfere with the completion of the defined objective. This dimension measures the individual’s resilience in seeking to overcome the challenges that permeate daily tasks.

Finally, the third concerns the “social effectiveness” that represents the expectations inherent to the social context, addressing the ability to establish relationships and live with different ideas and worldviews.

The study of self-efficacy in the business environment is important since the rational decision-making models are limited and do not consider behavioral aspects essential for understanding the elements that are related to decision-making (Wallauer *et al.*, 2010). In this scope, there are empirical investigations that analyzed the relationship between self-efficacy and decision-making in various contexts (Forbes, 2005; Bryant, 2007; Hmieleski & Baron, 2008; Engel, Dimitrova, Khapova & Elfring, 2014; Myburgh *et al.*, 2015).

Forbes (2005) confirmed the existence of a relationship between strategic decision making and self-efficacy with managers of American companies. The findings indicate that by affecting the levels of self-efficacy, the external environment can influence the organization’s decision-making and long-term results. In this sense, a duality relationship between strategic decision and self-efficacy is identified.

Bryant (2007) analyzed the role of self-efficacy together with regulatory pride, which addresses the possibilities of errors of omission and commission, in decision-making processes. The study was developed from semi-structured interviews carried out with entrepreneurs, with aspects related to decision making being addressed. The reports indicated that self-efficacy and regulatory pride are manifested with greater intensity in the search for opportunities, but even so they depend on systematic and rational analyzes in the decision-making context.

Hmieleski and Baron (2008) investigated the moderating effect of optimism and environmental dynamism on the relationship between self-efficacy and company performance, which was measured by the growth in revenues and the number of employees. The sample consisted of American companies, and the statistical analyzes pointed to the existence of a moderating effect in the proposed relationship according to the business environment. Forbes (2005) cites the need for managers to dedicate more time and attention in contexts where self-efficacy is low or in situations of uncertainty and inexperience of managers, so that possible barriers that affect the decision-making process are overcome. Thus, Engel *et al.* (2014) showed that self-efficacy is able to compensate for the inexperience of managers when faced to decision-making when opening new businesses.

From the studies listed, it is noted that self-efficacy has the ability on relating to decision making. In addition, Myburgh *et al.* (2015) argue that the problem-solving skills, effort, perseverance and importance attributed to tasks are influenced by self-efficacy, and it is pertinent to address the behavior of managers in the study of the relationship between self-efficacy and decision-making.



## 2.2 Decision-Making Process and Construction of the Research Hypothesis

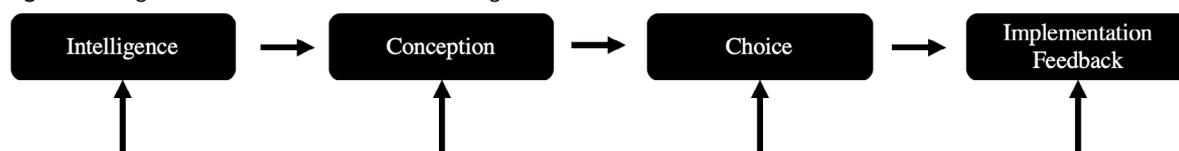
The decision-making process comprises the elements that affect the choices of individuals in the most varied situations (Kladis & Freitas, 1995). At the organizational level, the choices made by managers seek to promote the willingness and effective work of the entire organization based on correct decisions and effective actions (Simon, 1960). Managers need to diagnose situations, identify solutions and options, predict the consequences, exert influence over third parties, deal with adversities and make the decision. Therefore, the decision-making process is not restricted to mechanical skills, but requires that social skills are used in choosing the best options and courses of action to be taken (Myburgh *et al.*, 2015).

Miniard, Engel and Blackwell (2000) point out three types of variables capable of influencing the way in which the subject makes the decision. The first consists of the individual differences of each person, in which the level of capacity for receiving and processing information can affect behavior towards decision making. The second refers to the environmental influences in which the situation occurs. Finally, the third consists of the psychological processes of cognition that are related to the decision-making process.

From the cognitive perspective, Simon (1960) developed a model composed of phases that involve the decision-making process. In the first phase, the problem is identified to be solved by the individual. The second phase consists of identifying possible solutions or alternatives for decision making. In the third phase, the most viable option is chosen. Finally, feedback occurs to identify the effects of the decision made and the points to be adjusted.

Shows the phases of the decision-making process.

Figure 1 - Stages or Phases of the Decision-Making Process



Source: Simon (1960)

In the intelligence phase, managers, in addition to spending time identifying the problem, analyze the general context surrounding the situation. Subsequently or concurrently, possible solutions to this problem are identified, these two phases require a high amount of time. Then, the choice of the best solution identified in the previous steps is made, with less time being spent for such action. Finally, the decision is implemented and the results and consequences of the choice made are evaluated (Simon, 1960).

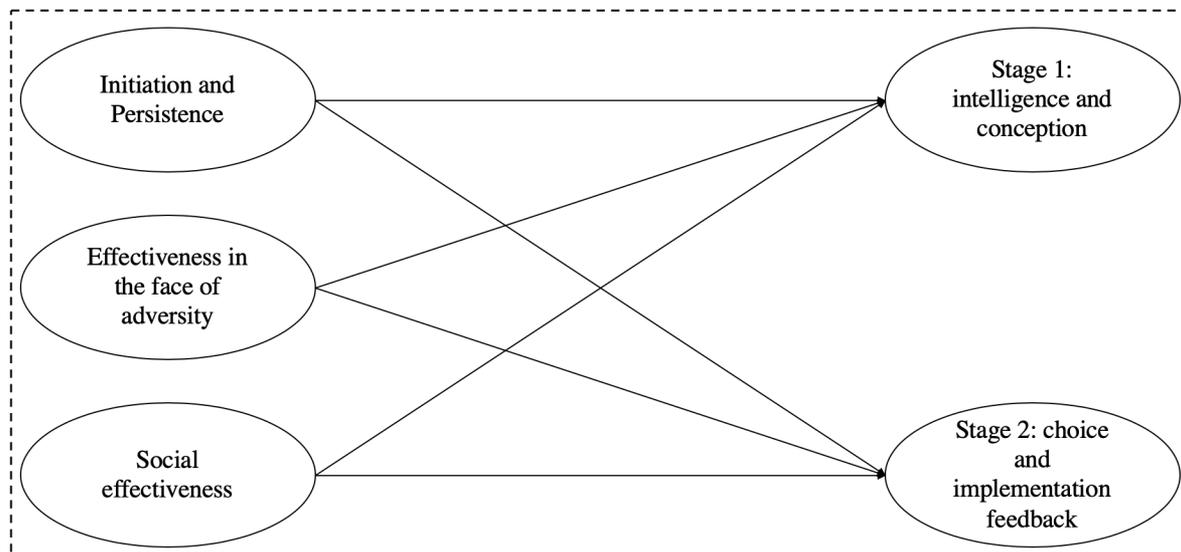
The behavior of the subjects at each stage of the decision-making process can vary according to the level of involvement with the problem and the ability to process information in the different stages of decision making (Svenson, 1996). Thus, in this research, the way in which the individual acts during the phases of the decision-making process is seen as a behavioral posture that characterizes his actions in face of the demands for capacity and the situations that are imposed on them.

The relationships verified in this research consist of the three second order constructs, proposed by Ribeiro (1995), which represent self-efficacy with the stages of the decision-making process. It is worth mentioning that each of the two stages of the decision-making process represents two phases proposed by Simon (1960), and the procedures performed for the formation of the stages are explained in the methodological section. From the discussions proposed in the literature, it is noted that the dimensions of self-efficacy may be related to the subject's efficiency and the ability to act

satisfactorily during decision making, however these elements are relatively unexplored in the observation and selection of managers, as well as in research that addresses the issue of decision-making (Beal, Weiss, Barros & Macdermid, 2005; Myburgh *et al.*, 2015). Thus, recognizing that the individual's behavioral posture during the decision-making process results from cognitive characteristics and perceptions attributed to decision-making, the following research hypothesis is elucidated:

H1: The dimensions of self-efficacy are related to the stages of the decision-making process. From the proposed research hypothesis, Figure 2 shows the research design.

**Figure 2** - Research design



Source: Prepared by the authors.

Through the analysis of **Figure 2** it appears that the model advocated in this study indicates that self-efficacy may be related to the behavioral posture adopted in the stages of the decision-making process. Thus, for Simon (1965), the behavior of each subject during the decision-making process is unique, since the personal cognitive characteristics interfere in decision-making. In addition, the author mentions that it is not possible to improve the decision-making process without understanding the individual's behavior, being relevant the analysis of such personal aspects in the scope of decision-making from the perception of Administration students to verify the behavioral variables that relate up with decision-making behavior.

### 3 RESEARCH METHODOLOGY

This research has a descriptive character and a quantitative approach. The data were collected through a survey carried out with the students of the Bachelor of Business Administration course at a public university located in the south of the country in the year 2017. I was obtained 79 valid entries to be analyzed. The characteristics of the survey respondents are shown in Table 1.

**Table 1 - Respondents Profile**

Gender				Year studied			
Female	46,84%	Male	53,16%	1 <sup>st</sup> Year	40,50%	3 <sup>th</sup> Year	15,19%
Age*				2 <sup>nd</sup> Year	25,32%	4 <sup>th</sup> Year	18,99%
Up to 19 years			30,38%	Another Graduation			
From 19 to 21 years			27,85%	No	92,40%	Yes	7,60%
From 21 to 23 years			17,72%	Employment Bond			
From 23 to 35 years			24,05%	No	24,05%	Yes	75,95%

**Note:** \* intervals calculated using the quartile inclusive formula.

Source: Research data (2017).

The largest proportion of respondents is male (53.16%). The predominant age group is composed by students aged up to 19 years (30.38%). As for the period studied, 40.50% of the participants are in the first year of the course, have an employment relationship (75.95%) and only 7.6% have another higher education course.

The data collection instrument consisted of three blocks, the first two of which were answered using an adapted scale of the likert type and aimed at surveying the students' perception of the daily decision-making process and self-efficacy and the last dedicated to the characterization of the respondents. The statements regarding to the decision-making process were adapted from existing instruments in the literature, for the self-efficacy construct, the original metric of the study by Ribeiro (1995) was used. Figure 3 describes the research constructs, an example of an assertion and source that guided the development of the instrument.

**Figure 3 - Research Constructs**

Construct Descriptions			Assertive Example	Source
Decision-making process 17 assertions	Stage 1: Intelligence and Design	Check the respondent's propensity regarding the attention spent in the intelligence and conception stage.	I usually establish the performance criteria for the decision alternatives.	Adapted from Pereira (2003)
	Stage 2: Choice and Implementation Feedback	Check the respondent's propensity regarding the attention spent in the choice and implementation stage.	I try to select the most suitable alternative for the solution of the problem.	
Self-efficacy 15 statements	Effectiveness in Adversity	Check the level of self-efficacy of the respondents in the dimension of initiation and persistence.	When I make plans I am sure that I am able to carry them out.	Ribeiro (1995)
	Effectiveness in Adversity	Check the level of self-efficacy of respondents in the dimension of effectiveness in the face of adversity.	When I'm trying to learn something new, if I don't succeed soon, I give up easily.	
	Social Effectiveness	Check the level of self-efficacy of respondents in the dimension of social effectiveness.	If I meet someone interesting with whom I have difficulty in establishing friendship, I quickly give up trying to befriend that person.	

Source: Prepared by the authors.



Data analysis was performed using the R Studio® software. The statistical technique used was Structural Equation Modeling (SEM) usually called Partial Least Squares Path Modeling (PLS-PM) and calculated by means of variance (VB-SEM) that allows the estimation of complex models of relationships from a reduced number of sample components (Ringle, Silva & Bido, 2014). The statistical analysis protocol is shown in Figure 3.

Figure 4 - Analysis Protocol

	Step	Objetive	Parameter	Reference
Measurement Model	DG. Rho	Evaluate the reliability and internal grouping capacity of the construct.	Values above 0.7.	Henseler, Ringle and Sinkovics (2009), Sanchez (2013) and Hair Jr., Hult, Ringle, and Sarstedt (2014)
	1 <sup>st</sup> Eigenvalue		Values above 1.	
	2 <sup>nd</sup> Eigenvalue		Values below 1.	
	Cross factorial loads and AVEs	Evaluate the independence of the latent variables observed in relation to the others.	Values above 0.5 and highest crossing value.	
Structural Model	Estimates of coefficients	Evaluate the significance of coefficients and endogenous regressions (t test).	Significant p-value by up to 10%.	Sanchez (2013)
	Correlations between latent variables	Evaluate the correlation between latent variables.	Relevant correlations, above 0.5.	
	R <sup>2</sup>	Evaluate the explanatory power of exogenous to endogenous variables.	There is not.	
	Goodness-of-Fit	Check the fit of the model.		

Source: Prepared by the authors.

Regarding to the sample size adequate for the use of Structural Equation Modeling, Hair Jr. *et al.* (2014) cite that it is recommended to be 10 times the largest number of paths pointed to a single latent variable. Through this criterion, the minimum number of respondents would be 30 participations. Furthermore, Ringle *et al.* (2014) recommend the usage of G \* Power® software in calculating the appropriate sample. Thus, with an Effect size  $f^2 = 0.15$ ,  $\alpha$  err prob = 0.05 and  $1-\beta$  err prob = 0.8, the minimum number of participations recommended for the application of Structural Equation Modeling was 77 respondents, as 79 participations were obtained, the prerequisite for analysis was met using the PLS-SEM technique.

Before carrying out the analysis of the paths through the PLS-SEM, the Exploratory Factor Analysis (AFE) was carried out in order to identify the formation of the factors that characterized the phases of the decision-making process. The induced groupings indicated the congruence of two factors, the first consisting of the grouping of the nine statements referring to the phases of intelligence (1) and conception (2) and the second factor made it possible to group the eight statements of choice (3) and implementation / feedback (4). Table 2 shows the information regarding to the KMO, Bartlett's sphericity test, explained total variance and the commonality of each factor.



**Table 2 - AFE indicators**

Factor 1 – Intelligence and Design		Factor 2 - Choice and Implementation / Feedback	
KMO	0,814	KMO	0,790
Bartlett's sphericity test	310,959 sig. = 0,000	Bartlett's sphericity test	273,500 sig. = 0,000
Total variance explained	49,593%	Total variance explained	52,692
Affirmatives	Communality	Affirmatives	Communality
Q1	0,578	Q3	0,400
Q2	0,466	Q4	0,584
Q5	0,646	Q7	0,534
Q6	0,501	Q8	0,584
Q9	0,537	Q11	0,434
Q10	0,664	Q12	0,578
Q13	0,492	Q16	0,523
Q14	0,701	Q17	0,577
Q15	0,479		

Source: Prepared by the authors.

Thus, it was decided to carry out the analysis based on the factors formed, being called by the researchers as Stages in the Decision Process, in which stage 1 of intelligence and design refers to the first factor formed and stage 2 of choice and implementation / feedback represents the second factor, both representing two phases defined in Simon's model (1960). In this context, it is worth noting that the decision-making process does not always occur phase by phase, the subject can identify the problems and solutions together, a fact that justifies the formation of both factors, since the respondents perceive the phases concurrently.

## 4 ANALYSIS AND DISCUSSION OF RESULTS

### 4.1 Measurement Model

The analysis of the measurement model has an internal character and aims at verifying the unidimensionality of the constructs through factor weights (Bido, Silva, Souza & Godoy, 2010; Sanchez, 2013). In this stage, the internal reliability of each construct is evaluated, in order to verify whether the assertions of the data collection instrument are able to represent the constructs that it proposes to measure (Hair Jr. *et al.*, 2014). To this end, it was decided to analyze the internal reliability through the DG. Rho or Compound Reliability and eigenvalues. The DG. Rho is a more efficient measure than Cronbach's Alpha, with values above 0.70 being considered reliable (Henseler *et al.*, 2009; Sanchez, 2013). As for eigenvalues, Sanchez (2013) states that the first eigenvalue must be above 1 and the second eigenvalue must be below 1 so that the indicators are unidimensional.

After the internal reliability indicators have been analyzed and validated, it is necessary to carry out Convergent Validation evaluated from the Average Variance Extracted (AVE). The strokes indicate how much of the variance of each latent variable is extracted from its indicators and how much these variables are related to their respective indicators (Sanchez, 2013; Ringle *et al.*, 2014). In this step, Henseler *et al.* (2009) recommend the use of the Fornell and Larcker criteria in which values equal to or above 0.50 ( $BIRDS \geq 0.50$ ) are considered adequate, as it means that each latent variable shares a greater proportion of variance with the indicators themselves than with indicators



attributed to other variables. Table 3 shows the correlation coefficients between the constructs, the internal reliability values and the Convergent Validity of the measurement model.

**Table 3** - Correlation between Constructs, internal reliability and Converged Validity

Variables	1	2	3	4	5
<b>1</b>	1,000				
<b>2</b>	<b>0,562</b>	1,000			
<b>3</b>	0,387	0,432	1,000		
<b>4</b>	0,260	<b>0,472</b>	<b>0,382</b>	1,000	
<b>5</b>	0,273	0,409	0,344	<b>0,796</b>	1,000
<b>DG. Rho &gt; 0,70</b>	0,847	0,854	0,767	0,899	0,899
<b>1<sup>st</sup> Eigenvalue &gt; 1,00</b>	2,32	2,75	1,59	4,24	4,22
<b>2<sup>nd</sup> Eigenvalue &lt; 1,00</b>	0,710	0,909	0,901	0,956	0,975
<b>AVE &gt; 0,50</b>	0,558	0,549	0,508	0,526	0,519

**Note:** 1 = Initiation and Persistence; 2 = Efficiency in the face of Adversity; 3 = Social Effectiveness; 4 = Stage of the Decision Process 1; 5 = Decision-making stage 2.

Source: Research data (2017).

The analysis of the correlations between the constructs allows “to have a sense of the relationships between the variables” (Sanchez, 2013, p. 84), while in Table 3 the greatest correlations of each construct are highlighted. The “Effectiveness Against Adversity” is positively related to the “Initiation and Persistence” ( $r = 0.562$ ) and to the “Stage of the Decision Process 1” ( $r = 0.472$ ). The “Stage of the Decision Process 2” has a high correlation with the “Stage of the Decision Process 1” ( $r = 0.796$ ). “Social Effectiveness” is shown to be positively associated with “Decision-Making Stage 1” ( $r = 0.382$ ).

It is also noticed that the parameters of internal reliability were met, as all the values of the DG. Rho were greater than 0.70, the first eigenvalues were greater and the second eigenvalues were less than 1. Additionally, all AVEs met the proposed parameter, having values above 0.50.

Finally, Discriminant Validation (DV) was carried out by checking cross factorial loads (cross-loadings). In this verification, the loads of the associated construct should preferably not be greater than the crossloadings of the other variables, forming a diagonal matrix (Sanchez, 2013). Table 4 shows the maximum and minimum values of the crossloadings and the associated construct.

**Table 4** - Discriminant Validation

Discriminant Validity	1	2	3	4	5
<b>Crossloadings (Minimum)</b>	0,077	0,102	0,023	0,010	0,020
<b>Crossloadings (Maximum)</b>	0,508	0,498	0,468	0,687	0,736
<b>Associated Construct (Minimum)</b>	0,610	0,441	0,452	0,539	0,605
<b>Associated Construct (Maximum)</b>	0,851	0,864	0,949	0,862	0,802

**Note:** 1 = Initiation and Persistence; 2 = Efficiency in the face of Adversity; 3 = Social Effectiveness; 4 = Stage of the Decision Process 1; 5 = Decision-making stage 2.

Source: Prepared by the authors.

In general, crossloadings indicate that there is independence between latent variables. Thus, through the validations of internal reliability, Convergent Validation and Discriminant Validation, it is possible to affirm that the structural model is adequate for the continuation of the analyzes.



## 4.2 Structural Model and Research Hypothesis

The evaluation of the structural model is carried out in conjunction with the analysis of the research hypothesis. The path coefficients between each dimension of self-efficacy and the stages of the decision-making process were verified. Table 5 shows the path coefficients, their significance, as well as the R<sup>2</sup> and Goodness-of-Fit of the structural model.

**Table 5** - Path Assessment and Research Hypothesis

Hypothesis	Way	$\beta$	<i>p</i> -value	Conclusion
H1	Start and Pers. > Est. Proc. Dec. E1	-0,056	0,664	Partly accepted
	Start and Pers. > Est. Proc. Dec. E2	0,020	0,872	
	Ef. Ad. > Est. Proc. Dec. E1	0,404	0,001***	
	Ef. Ad. > Est. Proc. Dec. E2	0,310	0,019**	
	Ef. Soc. > Est. Proc. Dec. E1	0,229	0,043**	
	Ef. Soc. > Est. Proc. Dec. E2	0,201	0,087*	
Construct		R <sup>2</sup>	Goodness-of-Fit	
Decision-making process stage 1		0,264**	0,351	
Decision-making process stage 2		0,202**		

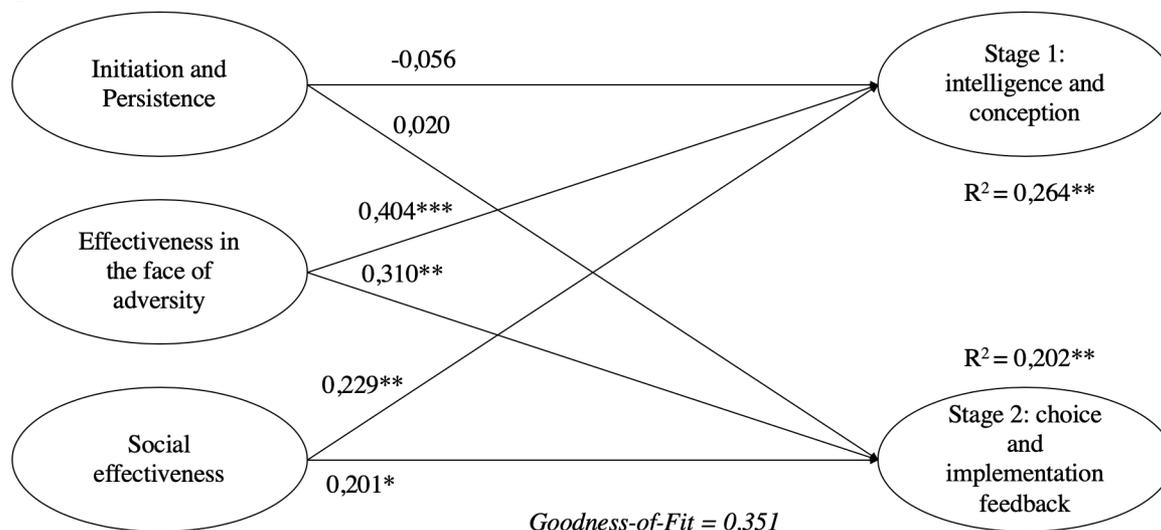
**Note:** Start and Pers. = Initiation and Persistence; Ef. Ad. = Efficiency in the face of Adversity; Ef. Soc. = Social Effectiveness; Est. Proc. Dec. E1 = Decision Process Stage 1; Est. Proc. Dec. E2 = Decision-making stage 2.

\*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Source: Research data (2017).

Table 5 shows the existence of effects considered significant at the level of 1%, 5% and 10%. In order to optimize the analysis and discussion of the results, Figure 5 represents the research design and the relationships verified through the path coefficients and their referred meanings.

**Figure 5** - Evaluation of Path Coefficients



**Note:** \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

Source: Research data (2017).

Through the path coefficients shown in Figure 5, it is possible to analyze the hypothesis proposed in this study. The research hypothesis states that there are significant relationships between the dimensions of self-efficacy and the stages of the decision-making process. In this sense, this hypothesis can be partially accepted, since in the dimension “Initiation and Persistence” no significant relationships were found, a fact that prevented its full acceptance.

As for the significant path coefficients, the dimension “Efficacy in the face of Adversity” had a positive effect on “Stage of the Decision Process 1” ( $\beta = 0.404$ ; p-value  $<0.010$ ) and “Stage of the Decision Process 2” ( $\beta = 0.310$ ; p-value  $<0.050$ ). Such finding indicates that the way the subject behaves during the stages of the decision-making process is affected by the way in which the adversities are faced in his life. Thus, people who tend to have positive thoughts and believe in their ability to overcome adversity, more efficiently assess the problem identified, possible solutions, make choices considered more assertive and implement and exercise feedback on an ongoing basis.

The “Social Effectiveness” dimension also had significant positive effects on “Decision-making Process Stage 1” ( $\beta = 0.229$ ; p-value  $<0.050$ ) and “Decision-making Process Stage 2” ( $\beta = 0.201$ ; p-value  $<0.100$ ). In this sense, academics who have a higher level of self-confidence in the face of social interaction tend to behave in an aligned manner with the optimal forms defended by Simon (1960) during the decision-making process.

The evidence corroborates with Simon (1960) and Wallauer *et al.* (2010) who highlight the importance of considering cognitive elements during decision-making since rational models have limited capacity to understand the elements that relate to behavior of the subject before the decision-making process. Like Forbes (2005) and Bryan (2007), self-efficacy proved to be significant, even if not in all dimensions, in the face of behavior in the decision-making process. The fact that the dimension “Initiation and Persistence” is not significant makes it opportune to develop new investigations in order to refute or confirm the results found in this study.

Like Bryan (2007), it is noted that self-efficacy is more intensely related in the initial stage of decision making, in this study represented by the “Stage of the Decision Process 1”. This stage is characterized by demanding greater dedication on the part of the subject, in addition, the search for alternatives and solutions demands the use of intuition, self-control and security of the individual who, as reported in the literature (Bandura, 2009; Coimbra, 2010) are associated to self-efficacy.

Thus, promoting the self-efficacy of business students is important since they are already or may be future managers. The lack of experience can be compensated with self-confidence in the face of the challenges and the decision-making process involved in the students’ daily lives. In addition, by maximizing the feeling of self-efficacy, it collaborates for the development of skills for problem solving, effort, perseverance and importance attributed to tasks (Myburgh *et al.*, 2015) and with assertive decision making.

Self-efficacy is able to explain approximately 26.40% of the subject’s behavior in the “Stage of the Decision Process 1” ( $\beta = 0.264$ ; p-value  $<0.050$ ) and 20.20% in the “Stage of the Decision Process 2” ( $\beta = 0.202$ ; p-value  $<0.050$ ). This result is relevant because, according to Cohen’s (1988) criteria, the  $R^2$  with values close to 0.26 indicate that the variables that make up the structural model and are related to the dependent variables have great effects on them. Finally, Goodness-of-Fit shows the adequacy of the model, as its GoF value = 0.351 approaches the global quality score of 0.36 (Tenenhaus, Vinzi, Chatelin & Lauro, 2005).



## 5 CONCLUSION

This study aimed at analyzing the relationship between self-efficacy and the stages of the decision-making process from the perception of undergraduate Business Administration students. Data were collected through a survey carried out with students from a public institution located in the south of the country. The application of the Structural Equation Modeling technique allowed testing the proposed hypothesis and developing the discussions that make up the research.

The evidence from the results indicates the ability of self-efficacy related to the attitudes of the participants adopted in the stages of the decision-making process. The first stage involves greater demands on the subject's time, dedication and effort in identifying the problem and possible proposed solutions. In this sense, self-efficacy appears as a driver of the individual's confidence in the face of the challenges experienced, supporting the cognitive process that permeates the recognition of the situation and the courses of actions to be traced. In the choice and implementation stage, significant effects were identified, but with less intensity in the relationship between self-efficacy and stages of the decision-making process.

Regarding to the "Effectiveness in the face of Adversity", it is necessary to foster in students the spirit of persistence and entrepreneurship, since there is a significant and positive relationship between them and the behavior in the decision-making process. Likewise, it is important to promote the levels of "Social Effectiveness" from the integration and development of capacities to deal with conflicts and interpersonal relationships, since this variable was related to the decision-making process. The development of integrative activities in the classroom or extra-class activities are options to be used to maximize the skills and positive experiences with interpersonal relationships and, consequently, increase "Social Effectiveness".

The fact that "Initiation and Persistence" did not present a significant relationship made it impossible to fully accept the hypothesis proposed in this investigation. Thus, future research may seek to confirm or refute the findings exposed here and to devote attention to this construct. The "Initiation and Persistence" may not have shown a relationship as it persists or not in a course of action is characterized as decision making, whether passive or active. In this sense, the perception of this construct would not cause effects on the subject's behavior during the stages of the decision-making process, as it would be permeating the lived experiences anyway. In view of the exposed introspection, research gaps are envisaged that can deepen the discussions of such a result.

Regarding to accountants, knowing the elements that relate to decision making becomes relevant, since the form of exposure and the type of information made available to managers can be worked on so that there is greater efficiency and quality in the information provided.

The limitations of the research are embodied in elements that can be improved in future studies. The cross-section time frame and the sample composition of academics at a university are limitations that can be overcome in the future. The strictly quantitative approach could be expanded to a joint analysis with qualitative methods in future research. The comparison of behavioral posture during decision-making and self-efficacy with individuals from different areas of knowledge are also opportunities for future studies.

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2. Development of hypotheses or research questions (empirical studies)	√	√	√	√
3. Development of theoretical propositions (theoretical work)	√	√	√	√
4. Theoretical foundation / Literature review	√	√	√	√
5. Definition of methodological procedures	√	√	√	√
6. Data collection	√	√		
7. Statistical analysis	√	√	√	√
8. Analysis and interpretation of data	√	√	√	√
9. Critical revision of the manuscript			√	√
10. Manuscript writing	√	√	√	√
11. Other (please specify)				

