Academic motivation from the perspective of the Self-Determination Theory

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Abstract

Objective: To verify the extent to which students' motivation changes during an Accounting Sciences Undergraduate Program.

Method: Data were collected from 2016 to 2021 using the Academic Motivation Scale (AMS) based on the self-determination theory. The data were treated by frequency distribution, boxplot graphs, and the Wilcoxon matched pairs test. The sample included 583 participants, 163 of whom answered the scale in the first and fourth years, totaling 746 responses.

Results: The results showed that the students' motivation level changed during the program. A statistically significant decrease was found in the motivation level concerning intrinsic motivation to know and achievement and extrinsic motivation of identification, while demotivation increased.

Contributions: This study's contribution concerns the confirmation that the change in motivation levels was the same throughout the course, both for students who responded at the beginning and end of the course and for those who responded only at the beginning or end of the program. This study also highlights the factors that fluctuated, allowing coordinators and educators to make decisions/actions to improve critical aspects.

1. Introduction

One of the theoretical foundations that postulate the understanding of human motivation was developed by Deci and Ryan (1985), called the Self-Determination Theory. Supported by empirical data, this theory suggests that human motivation arises from satisfying three basic psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2000). The satisfaction of such needs may differ between individuals, but it is considered essential for healthy human development.

This theory is applied in several knowledge fields, and many studies test its theoretical assumptions specifically in the educational field. The emphasis is on the research instrument called the academic motivation scale (AMS), which has been validated in several studies (Vallerand, Blais, Briere, and Pelletier, 1989; Sobral, 2003).

Deci, Vallerand, Pelletier, and Ryan (1991) mention that the application of this theory in the educational field is mainly concerned with promoting students' interest in learning, the appreciation of education, and confidence in their abilities. They further describe that the desired results will be achieved only by students being intrinsically motivated and by internalizing values and regulatory processes.

The context mentioned by Deci *et al.* (1991) shows that if educational institutions are interested in encouraging students to get interested and appreciate education, they must pay attention and identify the academic motivation levels (how motivated students are) and motivational types (intrinsically or extrinsically) to include policies and procedures during programs to maintain or increase the students' motivation levels and help them develop intrinsic motivation.

More recently, Ryan and Deci (2020) confirmed the same context when reviewing empirical studies using the SDT, showing that when well internalized, both intrinsic and extrinsic motivation predict positive outcomes at various educational levels and cultural contexts.

Nonetheless, Reeve and Lee (2014), by assessing Korean high school students, and Gnambs and Hanfstingl (2016), assessing adolescents from 52 high schools in Austria, empirically analyzed the level of motivation longitudinally and found it oscillates over time. Scherrer and Preckel (2019) analyzed school life, mentioning that theoretical approaches and empirical research suggest a decline in motivation variables and students' self-esteem throughout their education. They conducted a meta-analysis of longitudinal studies addressing the topic, showing a decrease in students' motivation levels.

Several empirical studies conducted in Brazilian Accounting Sciences programs used AMS to assess motivation (Leal, Miranda & Carmo, 2013; Cunha, Nascimento & Durso, 2016; Borges, Miranda & Calheira, 2017; Pavão, Borges & Voese, 2020; Santos, Pavão & Borges, 2021). These studies adopted a cross-sectional approach and failed to verify whether motivation fluctuates throughout the program and how it happens. Cunha *et al.* (2016) investigated university dropout, and even though they performed a cross-sectional study, they argue that their empirical results indicate that students start the program motivated. However, the frustration experienced throughout the program demotivated them.

Based on the findings of Scherrer and Preckel (2019) about the importance of fluctuations in student motivation over time and the fact that this aspect is not well understood among Accounting students, this study seeks to answer the following question: **To what extent does the students' motivation change during the Accounting program, considering the motivational types recommended by SDT?**

It is important to verify the existence of fluctuations in the students' motivation throughout the program and identify the factors causing such fluctuations to devise actions to reverse or minimize this condition, considering that students are expected to feel motivated as they deepen their preparation as future professionals.

Data were collected from 583 individuals attending the first and fourth years of the Accounting undergraduate program from 2016 to 2021. They responded to the instrument Sobral (2003) proposed to assess academic motivation. Of these, 163 individuals answered the instrument when attending the first year and, later, in the fourth year.

A general analysis, without considering the year of the program the students were attending (first or fourth year), indicated a high level of motivation in virtually all intrinsic and extrinsic motivation types. The score related to demotivation presented a low level of agreement, i.e., the respondents did not consider themselves unmotivated towards the program.

On the other hand, when the students' trajectory during the program was assessed using the matched pairs test, the findings showed that their motivational levels decreased significantly. The mean scores concerning intrinsic motivation (to know and to achieve) and extrinsic identification dropped the most from one period to the next. At the same time, "demotivation" obtained the highest scores at the end of the program. Evidence was statistically significant at a 5% level.

These findings contribute to scientific knowledge by confirming that motivation decreased during the Accounting Sciences program, indicating the most affected factors. From an academic and social point of view, this study indicates that low motivation levels and high demotivation may affect the students' performance, having the potential to affect the careers of those who remain in this area of work.

The implications are that managers/coordinators and educators may pay attention to this behavior to enable the analysis/implementation of actions intended to adjust the level of motivation, especially in the most affected aspects. According to Ryan and Deci (2020), SDT applications in education focus on facilitating the satisfaction of the basic psychological needs of students and educators. Another implication of these results is that the factors that present problems have the potential to explain dropouts.

2. Self-Determination Theory (SDT)

The SDT, proposed by Deci and Ryan (1985) and Deci *et al.* (1991), differs from other motivational theories because it does not treat motivation dichotomously, i.e., extrinsic and intrinsic motivation, bringing in its essence the concept of autonomous and controlled motivation. According to Gagné and Deci (2005), autonomy means acting according to one's own will and making choices at the highest level of reflection. They mention intrinsic motivation as an example of autonomous motivation. On the other hand, controlled motivation presupposes a feeling of pressure directing one's action.

Deci and Ryan (2005) bring the concept of autonomous and controlled motivation and postulate that people's behavior can be characterized according to the degree of autonomy or control involved, i.e., different degrees of intrinsic and extrinsic motivation. Intrinsic motivation presupposes individuals choose to perform an action, and satisfaction derives from the action itself, regardless of external rewards. On the other hand, extrinsic motivation requires a certain instrumentality towards the result of a given action, requiring external rewards for an individual to obtain satisfaction for performing the action.

Autonomous and controlled motivation contrasts with the concept of demotivation, also mentioned in SDT, which presupposes a lack of motivation to act. From this perspective of intrinsic motivation, extrinsic motivation, and demotivation, Deci and Ryan (1985) proposed a classification that involved the construct of demotivation, intrinsic motivation, and extrinsic motivation, the latter being divided into four types (external, introjection, identified, and integrated), which they called self-determination continuum.

Later, Vallerand and Blais (1987) proposed the breakdown of intrinsic motivation into three types (to know, to achieve, and to experience stimulation). Based on these SDT concepts, Vallerand *et al.* (1989) built and validated an instrument to measure motivation in the educational context. However, such an instrument did not consider integrated extrinsic motivation, as the tests conducted to validate the instrument did not differentiate between the types of identified and integrated motivation.

According to Ryan and Deci (2020), among the three types of extrinsic motivation, external regulation is the one with the lowest level of autonomy, i.e., the individual's action is not spontaneous; rather, it is intended to obtain a particular reward or avoid punishment. On the other hand, identified regulation presents one of the highest levels of autonomy in the context of extrinsic motivations Even though the individual is focusing on external benefits, s/he acts spontaneously because the act is coherent with his/her values and objectives (Ryan & Deci, 2020).

Regarding intrinsic motivation, which comprises internal motivational aspects in which the individual does something out of interest and pleasure inherent to the action itself, Vallerand, Pelletier, Blais, Briere, Senécal & Vallières (1992) note that the motivation to experience stimulation involves doing something to experience stimulating sensations of a sensorial or aesthetic nature. Motivation for achievement comprises doing something for the pleasure and satisfaction of accomplishing or creating things. In contrast, motivation to know concerns doing something for the pleasure that comes from learning, exploring, or understanding.

Another factor analyzed in SDT is demotivation, which, according to Vallerand *et al.* (1992), occurs when the individual does not perceive a link between the results and actions, i.e., when they are neither intrinsically nor extrinsically motivated.

One of the central hypotheses of SDT in education is that more autonomous forms of motivation lead to increased student engagement, learning, and well-being and that basic psychological support from educators and parents facilitates this motivation, while the frustration resulting from being obliged to take a program weakens it (Ryan & Deci, 2020).

As previously mentioned, several studies were conducted in Brazilian Accounting Sciences programs that considered the SDT assumptions. Leal *et al.* (2013) investigated the motivation of 259 students attending any the periods of the Accounting program at a public university. They used exploratory factor analysis and identified seven factors that explained 61.09% of the data's total variability. Their results partially converged with those of previous studies, showing the existence of a very diverse motivation for learning among university students.

Cunha *et al.* (2016) investigated the reasons for the evasion of students from the first year of Accounting Sciences programs in public Higher Education Institutes (IES). The sample included 348 students who entered the programs in 2013 of six federal universities in Southeast Brazil. The results showed that students were significantly enthusiastic about the program when they entered college, even though there were signs that the choice of the program was not a well-guided process.

Borges *et al.* (2017) analyzed the relationships between academic performance and motivation among students attending the Accounting Sciences program at a Brazilian public university. They addressed a sample of 316 students from the second to tenth periods, and the regression analysis indicated significant relationships between motivation and academic achievement.

Pavão *et al.* (2020) verified intrinsic motivation, extrinsic motivation, demotivation, and perceived academic performance of Accounting Sciences students at a public university. The results from a sample of 168 respondents showed no statistically significant difference regarding perceived performance.

Santos *et al.* (2021) analyzed the motivational interests of Accounting Sciences students at a public university to enter and remain in the program. They addressed a sample of 168 students, and the results showed that the students were intrinsically and extrinsically motivated, with no high level of demotivation identified.

Note that these studies adopted a cross-sectional approach to collecting data. Such an approach does not allow for capturing fluctuations in the student's level of motivation throughout the program or the type of motivation that changes, especially when dealing with the same individual from the beginning to the end of the program, precisely what sets this study apart.

3. Methodological Procedures

Data were collected from the students attending the Accounting Sciences undergraduate program at a public state university in Paraná, Brazil.

The research instrument was the Academic Motivation Scale (AMS) developed by Vallerand *et al.* (1992) and adapted to Brazil by Sobral (2003); the Brazilian version is called the *Escala de Motivação Acadêmica (EMA)*. This scale enables measuring the types and levels of motivation toward educational tasks through 28 questions addressing seven motivational factors. Thus, the following question was asked to the students: Why do I come to the university? According to Hill (2013), this instrument is frequently used when evaluating the motivation of high school and college students.

This is a longitudinal study in which participants were encouraged to participate at more than one point in time during the program. Hence, the same individual was approached at the beginning and the end of the program. Data were collected from a sample of 583 individuals attending the program's first and fourth years, from 2016 to 2021. They answered the instrument Sobral (2003) proposed to assess academic motivation. Hence, the students attending the first year in 2016 answered the instrument again in 2019, those who answered it in 2017 answered a second time in 2020, and so on.

From this sample, 163 students answered the instrument in the first and fourth years, totaling 746 responses. The remaining students answered only in the first or the fourth year. The reasons include dropouts, failing a subject, delays, or absence of the data collection dates. Note that enrollment in the program at the institution under study is renewed annually rather than every six months. Additionally, the program typically lasts four years; hence, data were collected once every year.

Frequency distribution and percentages were used to describe the categorical variables, and the distributions of the variables were assessed using boxplot graphs. Note that the Shapiro-Wilk test indicated that the scores obtained for all the factors showed significant evidence of violation of normality. For this reason, non-parametric statistical techniques were used for inferential analyses.

The non-parametric Wilcoxon test was used to assess the difference in the factors' scores obtained at the two points in time for the students who answered the instrument in the first and fourth years and for those who answered only once (either in the first or fourth year). The Wilcoxon matched pairs test uses the ranks of ordered observations, being an ordinal level method.

D is defined as the difference of the variable measured between the first and second points in time. When ordering the absolute values of the calculated differences, except for differences equal to zero, a score R_i is assigned to each value, D_i, i=1, 2, …, n. In case of a tie, the score is given by the average of the orders of repeated observations. Next, the sum of the R_i ranks is performed, multiplied by the sign of the difference. According to Sheskin (2003), the W statistic is given by the expression below:

$$W = \sum_{i=1}^{n} [sinal(D_i) \times R_i]$$

The significance level was set at 5% for all the tests. All analyses used the statistical environment R (R Development Core Team, 2016), version 3.6.2.

4. Presentation and Analysis of Results

This section is organized into two topics: (1) general analysis containing the descriptive statistics of the analyses of the total frequency distributions, i.e., including all respondents, regardless of the year attended, and the boxplot analysis; and (2) the matched pairs analysis concerning the 163 students who answered in the first and fourth years of the program and the matched pairs analysis with all respondents in the sample.

4.1 General Analysis

First, we present the frequency distribution of the participants' characteristics. Among the 746 responses, 62.06% of students were attending the first year and 37.94% were in the fourth year. Most were between 16 and 22 (76.54%), only 6.84% were 28 or older.

The minimum age was 16, and the maximum was 51, with an average of 20.89 years old and a coefficient of variation of 20.81%, indicating low variability around the mean. Regarding the region, more than half of the participants (56.57%) reported being originally from the same region/city/state where they attended the program, while 43.43% came from other locations.

Next, the frequency distribution was analyzed using a boxplot (Figure 1) of all the answers provided to the academic motivation scale adapted by Sobral (2003), ordered according to the subject. There are four questions for each factor, numbered as they appear in the questionnaire, represented by the four numbers on the far left.

The percentages located on the left of the graph (Figure 1) indicate the relative frequency of responses with low scores (1 to 3), the percentage of moderate scores (4) are in in the center, and the percentage of high scores (5 to 7) are on the right. Thus, the sum of the three percentages for each line is 100%. The letters represent groups (factors) of questions and correspond to demotivation (A), extrinsic motivation - external control (B), extrinsic motivation - Introjection (C), extrinsic motivation - Identification (D), intrinsic motivation - to experience stimulation (E), intrinsic motivation - for achievement (F) and intrinsic motivation - for knowledge (G).
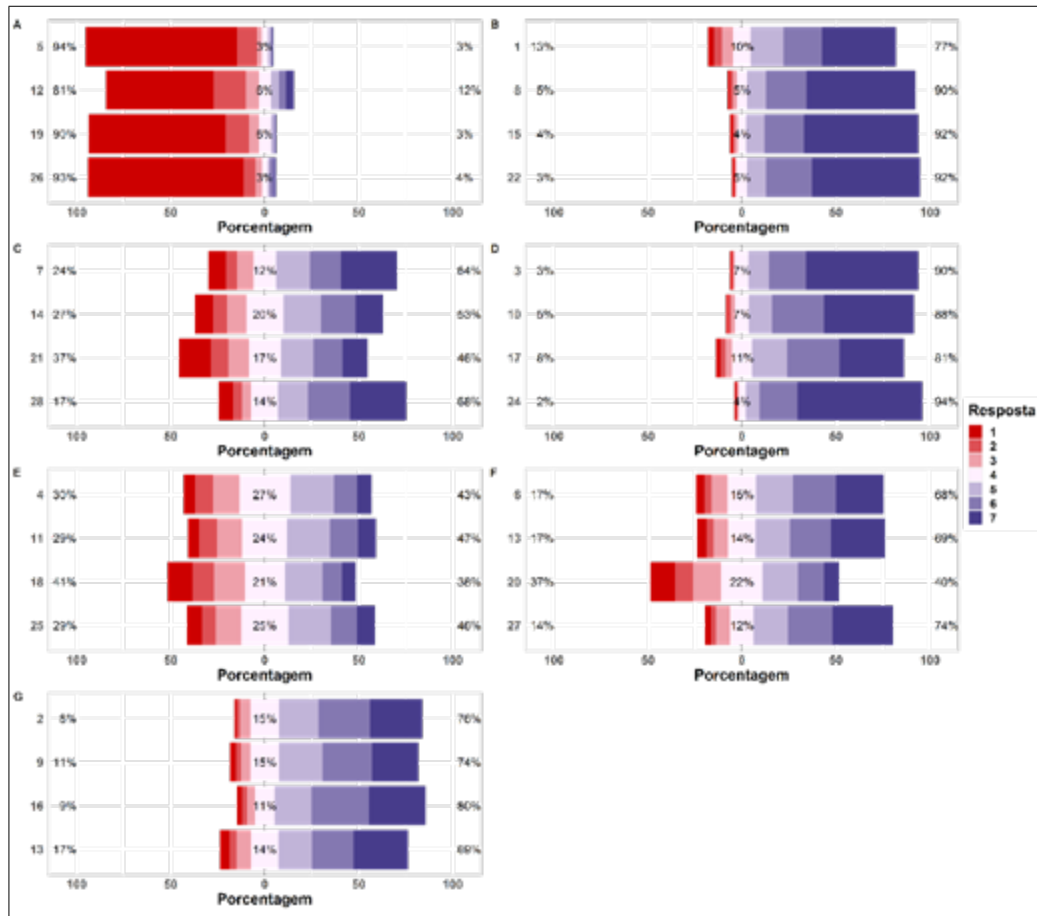
Source: Study's data.

Figure 1. Matched pairs distribution of the scores obtained by the 163 participants in the factors according to the year attended (first and fourth years)
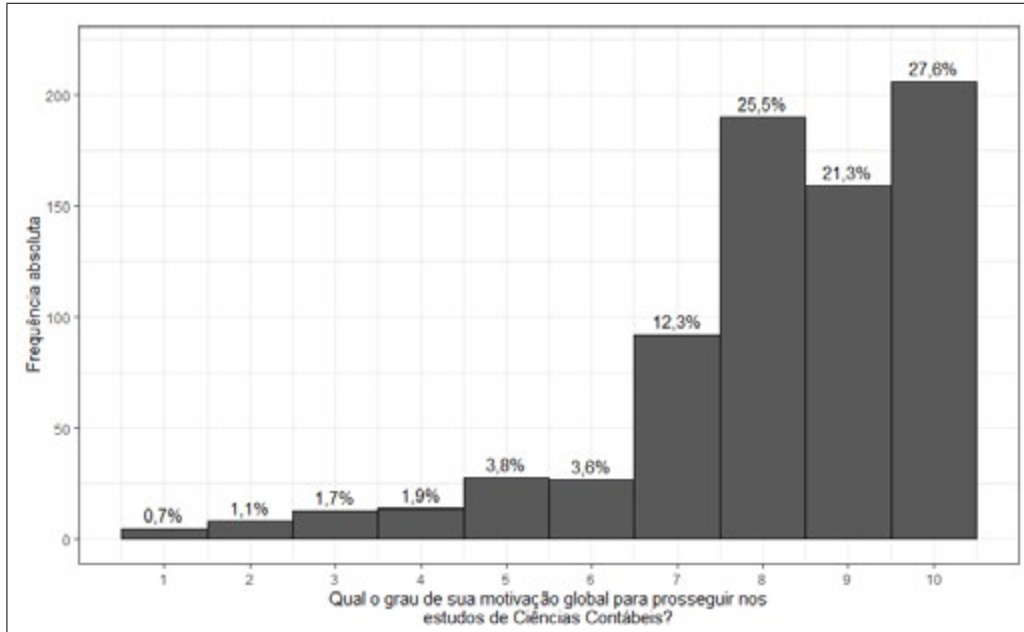
Note that more scores are below 4 for most of the questions in block A, indicating a low level of demotivation, a result similar to what Leal *et al.* (2013) and Borges *et al.* (2017) found.

The opposite happens in B, D, F, and G topics, where most answers obtained scores greater than or equal to 4. These results indicate a higher motivational level for the factors: extrinsic motivation - external control (B), extrinsic motivation - Identification (D), intrinsic motivation - for achievement (F), and intrinsic motivation - for knowledge (G).

Furthermore, the distribution is more balanced for the other blocks (C and E), though still favoring responses that indicate greater correspondence with motivation. These results cannot be compared with previous studies due to the differences between the instrument scales and the analyses, which generally use factor analysis to group the factors, which does not allow for the factors to be analyzed separately.

Without considering the period of the program the students were attending (first or fourth year) the overall analysis showed that they had a higher motivational level in virtually all types of intrinsic and extrinsic motivation. On the other hand, the score related to demotivation presents a low level of agreement, i.e., the respondents did not consider themselves unmotivated toward the program.

One question was added to the instrument to verify the respondents' spontaneous perception regarding their motivation to remain in the program, called the degree of global motivation. Figure 2 shows that, on a scale from 0 to 10, approximately three-quarters of the individuals reported a satisfaction level between 8 and 10 (74.4%). Only 5.4% indicated a motivation level below 5 on this same scale. These scores show that few students were unmotivated or uninterested in the program and their chosen profession.

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Source: Study's data.

Figure 2. Distribution of frequencies to the answers provided to the question regarding global motivation to proceed with the Accounting Sciences Program

4.2 Matched Pair Analysis

The first analysis of this section refers to the two answers given by the 163 students who took part at two points in time (first and fourth years). Next, we present the results concerning the comparison between the scores of the factors according to the year attended.
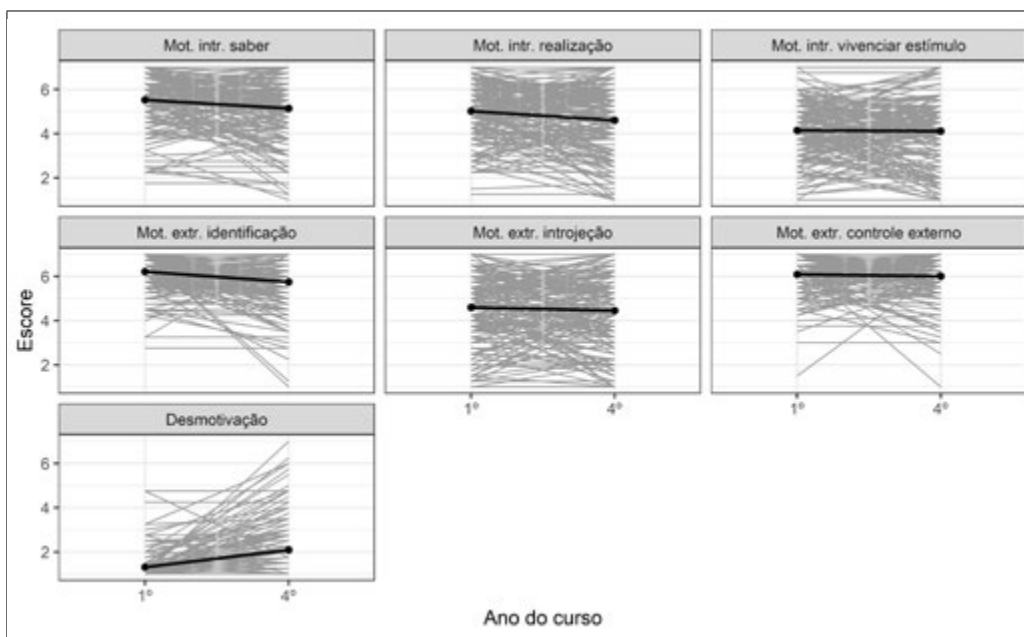
Source: Study's data.

Figure 3. Matched pairs distribution of the scores obtained by the 163 participants in the factors according to the year attended (first and fourth years)

Figure 3 shows that, on average, the demotivation score tends to increase among the students between the first and last year of the program, while the motivation scores decrease slightly. In this sense, the intrinsic motivation to know and achieve and the extrinsic motivation of identification stand out, clearly showing the most significant drops in the average scores from one point to the next.

Table 1

Matched pairs comparison of the scores concerning the motivation factors according to the year attended by the 163 participants (first and fourth years)

Factor	Year	Mean	SD	Median	Minimum	Maximum	p-value
Intrins. motivation to know	1º	5,53	1,18	5,75	1,75	7,00	0,001*
	4º	5,15	1,41	5,50	1,00	7,00	
Intrins. motivation to achieve	1º	5,02	1,30	5,25	1,25	7,00	0,001*
	4º	4,60	1,56	5,00	1,00	7,00	
Intrins. motivation to experience stimulation	1º	0,41	1,30	4,25	1,00	7,00	0,852
	4º	4,12	1,49	4,25	1,00	7,00	
Extrins. motivation of identification	1º	6,22	0,82	6,50	2,75	7,00	<0,001*
	4º	5,75	1,16	6,00	1,00	7,00	
Extrins. motivation introjection	1º	4,60	1,55	5,00	1,00	7,00	0,359
	4º	4,46	0,16	4,75	1,00	7,00	
Extrins. motivation external control	1º	0,61	0,91	6,25	1,50	7,00	0,411
	4º	6,01	1,06	6,25	1,00	7,00	
Demotivation	1º	1,31	0,66	1,00	1,00	4,75	<0,001*
	4º	2,09	1,34	1,75	1,00	7,00	

Note: *p-value < 0.05.

Source: Study's data.

Table 1 shows no significant difference between the scores of the intrinsic motivation factors of experiencing stimuli and extrinsic motivation of introjection and external control (p-values equal to 0.852; 0.359 and 0.411, respectively) from the first to the fourth year of the program, according to the results of the Wilcoxon matched pairs test, considering 5% significance.

On the other hand, the other factors differed significantly between the two points in time; the motivation scores (mean and median) were higher for the first-year students than for the fourth-years. The opposite was verified for demotivation. The Wilcoxon test confirms the visual analysis in Figure 2 that the decrease in the intrinsic motivation scores of knowledge and achievement and the extrinsic motivation of identification significantly differed from the first to the fourth year.

A comparative analysis according to year was also conducted for the 746 answers provided by the 583 participants. The results of the Wilcoxon test concerning the comparison between the scores obtained in the factors according to the year (Table 2) show that the scores of the first-year and fourth-year students differed significantly for the intrinsic motivation factors of knowledge and achievement, extrinsic identification motivation, and demotivation (p-values equal to 0.004; 0.017; <0.001 and <0.001, respectively), at the 5% level of significance. In all cases, except for demotivation, the median score obtained by first-year students was higher than that of the fourth-year students.

Table 2

Comparison of the scores concerning the motivation factors according to the year attended by the 583 participants

Factor	Year	Mean	SD	Median	Minimum	Maximum	p-value
Intrins. motivation to know	1º	5,59	1,14	5,75	1,25	7,00	0,004*
	4º	0,53	1,30	5,50	1,00	7,00	
Intrins. motivation to achieve	1º	5,01	1,34	5,25	1,00	7,00	0,017*
	4º	4,76	1,42	5,00	1,00	7,00	
Intrins. motivation to experience stimulation	1º	4,19	1,31	4,25	1,00	7,00	0,388
	4º	4,07	1,39	4,25	1,00	7,00	
Extrins. motivation of identification	1º	6,21	0,86	6,50	2,25	7,00	<0,001*
	4º	5,85	1,05	6,00	1,00	7,00	
Extrins. motivation introjection	1º	4,69	1,57	5,00	1,00	7,00	0,355
	4º	0,46	1,56	5,00	1,00	7,00	
Extrins. motivation external control	1º	6,10	0,99	6,25	1,50	7,00	0,153
	4º	0,60	1,08	6,25	1,00	7,00	
Demotivation	1º	1,41	0,74	1,00	1,00	5,00	<0,001*
		1,97	1,27	1,50	1,00	7,00	

Note: *p-value < 0.05.

Source: Study's data.

No statistically significant differences were found between the years (p-values equal to 0.388, 0.355, and 0.153, respectively) for the other factors, i.e., intrinsic motivation to experience stimulation and extrinsic motivation for introjection and external control. The first and fourth-year students obtained the same median scores for the last two factors.

Tables 1 and 2 show similar results. The same factors presented statistical significance, showing a significant drop in the motivation factors internal motivation to know, achievement, and external identification motivation in the analysis with the 163 students and the total sample. Additionally, demotivation increased. Although a different analysis of the factors was performed, these results are similar to those found by Leal *et al.* (2013) regarding intrinsic motivation, identification, and demotivation.

This result contributes to scientific knowledge by confirming a change in students' motivational levels throughout the program and identifying which factors influence a decrease in motivation.

Regarding intrinsic motivation, which comprises internal motivational aspects, in which an individual does something for his/her interest and pleasure that are inherent to the action itself, it is clear that the students obtained lower scores in extrinsic factors, indicating that, even with a high degree of agreement regarding the questions of intrinsic factors, the participants were less intrinsically motivated.

Specifically regarding the intrinsic factor "experiencing stimuli," which comprises doing something to experience stimulating sensations, the scores' distribution was symmetrical, i.e., the responses were balanced between agreement, neutral, and disagreement. A potential explanation for such a result is that, considering the program's characteristics, Accounting students are not encouraged to experience stimulating sensations, whether sensorial or static.

The responses to the intrinsic motivational factors of knowledge and achievement showed a high degree of agreement, indicating that students have intrinsic motivations for completing the program. On the other hand, a significant difference was found in the comparison between first-year and fourth-year students, i.e., their respective motivations decreased significantly over the course of the program.

As for the drop in intrinsic motivation to know, the students at the end of the program (fourth year) no longer experienced the same pleasure in learning or understanding something as they did in the first year of the program. The drop in intrinsic motivation for achievement indicates that taking the program for the pleasure that comes from creating or accomplishing something is no longer the same as in the first year. For Ryan and Deci (2020), intrinsic motivation is linked to aspects of interest, pleasure, and satisfaction, having a perceived locus of internal causality, that is, part of the individual.

For Reeve, Hamm, and Nix (2003), the rise and fall of intrinsic motivation occurs as environmental and interpersonal variables support and interfere with people's experiences of self-determination and competence. Studies show that the benefits of intrinsic motivation are linked to engagement and high performance (Ryan & Deci, 2020). Therefore, a decrease in this type of motivation is of concern because it might reduce student performance, as the results of Borges *et al.* (2019) show.

Figures 1 and 3 and Tables 1 and 2 show that the scores concerning the factors "extrinsic motivation – identification, introjection, and external control" presented a high degree of agreement, indicating that the students were motivated to take the program because they decided to do so (identification), they pressured themselves to do so (introjection) or were pressured by others to do so (external control). These factors are more frequently linked to the individuals' external aspects; their motivation is linked to obtaining rewards or avoiding punishments.

A significant difference was found between first- and fourth-year students concerning external identification motivation, indicating that, for some reason, the decision to take the program in the fourth year is no longer as good as when one was in the program's first year. Ryan and Deci (2020) mention that the person consciously identifies or personally endorses the value of an activity in identification motivation and, therefore, experiences a relatively high degree of willingness to act. In this regard, recognition of the value of taking the program decreases over time in the sample.

Additionally, according to SDT, intrinsic and extrinsic identification motivation present the characteristic of autonomy; however, for Ryan and Deci (2020), intrinsic motivation is based on interest and pleasure, while identified motivation is based on a sense of value.

Therefore, the drop in motivation levels in these three factors shows a need for actions aimed at providing support for the promotion of autonomy, both focused on interest and value. This becomes even more important in light of the results of Borges *et al.* (2017), which show that both intrinsic and extrinsic identification motivation was positively related to performance.

When comparing the demotivation factor between the first- and fourth-year students, the fourth-year students are more frequently unmotivated than first-year students. This result presented a p-value < 0.001 at a 95% significance level.

For Ryan and Deci (2020), demotivation is common in classroom environments. It may result from a lack of competence to perform or a lack of value or interest, a strong negative predictor of engagement, learning, and well-being. The increase in demotivation is linked to the same points discussed previously, i.e., lack of interest (intrinsic motivation) and lack of value (extrinsic identification motivation). As Vallerand *et al.* (1992) pointed out, when experiencing demotivation, the individual is neither intrinsically nor extrinsically motivated.

This analysis suggests that the factors showing negative oscillation possibly explain dropout. This matter was not the subject of analysis in this study. However, it appears as a potential hypothesis for dropout during undergraduate studies, especially among those experiencing these factors more acutely during the program.

This study's contributions include the information that the students' behavior was the same regardless of whether the same individual responded to the scale at the beginning or at end of the program, or different individuals responded in isolation in the first or fourth year, confirming the same change in the same factors. An implication is that professors and program coordinators can check which factors are fluctuating during the program so that preventive actions are taken, even with the application of the cross-sectional scale using paired analysis.

5. Conclusion

The question guiding this study was, "To what extent does the motivation of students change during the Accounting Sciences undergraduate program concerning the motivational types recommended by the Self-Determination Theory?" Data were collected from a sample of 583 students attending the first and fourth years of the program from 2016 to 2021. The participants answered the instrument Sobral (2003) proposed to assess academic motivation, and 163 answered when attending the first and fourth years, totaling 746 responses.

Without considering the year the students attended (first or fourth year), a general analysis showed that they presented a high motivational level in virtually all types of intrinsic and extrinsic motivation. The score related to demotivation presented a low level of agreement, i.e., the respondents did not consider themselves unmotivated toward the program. This finding is aligned with what is expected of students in the program, i.e., their motivational level was high, and their level of demotivation was low.

On the other hand, when we assessed the students' trajectory during the program through matched pairs analysis, the results showed that the motivational level decreased, with three factors showing a statistically significant difference in the scores. At the same time, the "demotivation" construct presented higher scores, i.e., a higher level of demotivation, which was also statistically significant at the 5% level.

The matched pairs analysis, in which the students answered the questionnaire in the first and fourth years, comprises this study's primary research focus and differs from previous studies. It sought to verify whether the students would experience a change in their motivational level throughout the program. The findings show that although students identified themselves with a higher level of motivation toward the program, it decreased throughout the program.

The "demotivation" factor stands out as an important finding, as the level of demotivation increased significantly between the first and fourth years. These results were confirmed both for the students who answered the instrument at the beginning and end of the program and for those who responded only at the beginning or end of the program. This finding is important as it shows that the level of motivation decreases and the level of demotivation increases in all the classes analyzed when comparing first-year with fourth-year students.

Students attending a reputable undergraduate program are expected to be as motivated at the end of the program as they were at the beginning. However, this was not found in the results, considering that the students' motivation level in four of the eight constructs analyzed decreased significantly, even though such a level remained high.

These findings imply that when checking which factors fluctuate the most, indicating demotivation or a drop in motivation, managers/coordinators and educators may take corrective and preventive actions to encourage students to continue considering the program pleasurable and valuable up to the end. Note that extreme cases of decreased motivation and increased demotivation might affect students psychologically and their future professional careers.

Notably, there were reflections of security measures due to the COVID-19 pandemic in 2020 and 2021. No changes in motivation and demotivation were found in 2020 and 2021 compared to the years before the pandemic though.

Future studies might expand understanding of these fluctuations by analyzing factors that lead to such a drop in motivation. Another suggestion is to investigate the fluctuation of motivation in the academic trajectory, which may be explained by other variables, such as student performance, learning styles, teaching methodologies, etc. A question emerged during this study as to whether the oscillation found is inherent to the Accounting Sciences program or happens in any institution and how it impacts an accountant's career.

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