The Relationship between First Year Students' Interaction, Basic Psychological Needs, and Academic Success

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Abstract   This study explores the relationship between students' social and academic integration, basic psychological needs and academic success. By linking the social and academic integration, which is primarily focused on students' relationships with peers and staff, to their psychological needs, we examine if need support in daily interactions would predict student success in their first year of college. The participants in this survey study, 140 first-year undergraduates, are enrolled in different universities of applied sciences in The Netherlands. The results of path analysis showed that peer interaction (social integration) directly supports students' need for relatedness as it establishes close social bonds with peers, while at the same time it indirectly, supports students' formal interaction with the teacher improving their intellectual involvement in the classroom. Most relevant to academic integration is students' formal interaction with the teacher, which is mediated through autonomy and competence needs and academic success. Though primary support for academic success can be linked to formal teacher interactions, the indirect support through formal peer interactions should not be overlooked. These findings, at the outset, confirm the importance of need-supportive teachers, but they also point out the importance of need support by peers, which is less emphasized by self-determination theory.

Keywords: social integration, academic integration, student interaction, basic psychological needs, self-determination theory, academic success

1. Introduction

Two well-known concepts seeking to explain student involvement in learning and success in college are the concept of psychological needs based on self-determination theory (SDT) [1], and the concept of social and academic integration by Tinto [2]. Both concepts, belonging to different domains of research, contribute significantly to our understanding of students' motivation and integration in college. In this article, we argue that when we link social and academic integration - primarily focused on students' network contacts with peers and staff - to psychological needs, we then include what needs to be addressed within these relationships for students to succeed.

From the perspective of SDT, students' learning and development are associated with support for the basic psychological needs relatedness, autonomy, and competence. Satisfaction of these needs is required for students to flourish and experience high-quality learning. SDT further argues that learning activities supporting the psychological needs improves students' autonomous motivation, associated with a variety of positive learning outcomes, such as cognitive engagement, increased effort, and persistence [3,4,5].

Tinto, from his perspective of social and academic integration, argues that first-year students entering college need to integrate into a new ongoing social and intellectual life. Persistence in this new world of college depends on how well students integrate. Central to a successful integration is whether students perceive their interactions to be meaningful and rewarding. Positive relationships between higher levels of integration and persistence in college is supported by different studies [6-11].

Although both concepts provide a rationale to explain students development and success, they are usually not linked to each other. For example, the primary requirement of SDT is the satisfaction of the basic psychological needs, which enables students to experience autonomous motivation. However, SDT does not clarify how different interactions in a college environment are linked to need support. Similarly, the concept of social and academic integration reasons that students who perceive their interactions to be meaningful and rewarding are more likely to integrate and increase their effort for learning. Nevertheless, this concept of student integration does not

explain how meaningful and rewarding interactions are identified, which improves their integration and effort for learning

We, therefore, reason, that since both concepts deal with students learning, related to their interactions and psychological needs, important connections between the concepts may exist. The discovery of these connections could increase our understanding of students' involvement and academic success in college. We, therefore, link the frameworks of formal and informal interaction and the basic psychological needs to academic success. Here, higher levels of academic success indicate that students obtained more credit points and are therefore more likely to persist.

2. Theoretical Background

2.1. Social and Academic Integration

Tinto posits that persistence in college is associated with increased levels social and academic integration [2]. Social and academic integration, shaped by students' daily involvement with peers and teachers, is facilitated by the formal and informal settings in college. Although persistence is best supported by a higher level of both social and academic integration, it may occur when only one type of integration is present.

For first-year students entering college, social integration is often of greater concern to the individual than academic integration, as support from peers helps them to overcome the difficulties of getting into college [12,13]. Dropping out from college is, therefore, more often associated with experiences of incongruence and isolation from social and academic communities rather than intellectual deficiencies [2].

The experience of membership of social communities indicates that students feel like they belong to a network of friends. Whereas, membership of academic communities, suggest that students are more involved in intellectual relationships, which makes them more likely to spend time and effort in learning and increase their chances to persist [7,13]. Further support for this notion is also found in several other studies [10,11,14]. However, some studies show that gender and ethnicity may affect the outcomes differently [8,15,16]. Still others point to inconsistencies in the operationalization of the concepts of social and academic integration. For example, interaction with faculty is seen as academic integration by Tinto though other researchers such as Pascarella [17] and Braxton [18] regard it as social integration. These differences may further clarify contradictory outcomes, between higher integration levels and persistence, found in some previous studies.

However, since Tinto does not operationalize the different types of integration, it leaves space for researchers to contextualize the definitions to their studies. This study, in the Dutch context, uses the operationalization of previous researchers in The Netherlands [6,19], which is based on the scales of Nora and Cabrera [15] and Berger and Milem [20]. In these studies, formal teacher interactions refer to study-related exchanges as instruction, feedback, and discussions which often takes place in a classroom setting.

Formal peer interactions are study-related exchanges with fellow students when working together on assignments in or outside the classroom, as opposed to informal interactions which are friendly conversations of personal nature, with teachers and peers outside the classroom. Of these four types of interactions, formal teacher interaction is the most central, and informal peer interaction the most distal to the classroom setting. These distances indicate the relative importance of the different interactions to students' persistence, since classroom involvement is considered as most essential to persistence [2].

As diverse students' perception of interactions with peers and teachers could vary considerably, it may, therefore, support their integration differently. Tinto argues that students who perceive their interactions to be meaningful and rewarding are more likely to integrate, and hence improve their chances to persist. However, he does not explicate how a meaningful or rewarding perception is to be determined. This study, therefore, reasons that such a perception that supports student integration and improves their effort in learning, might be linked to higher levels of motivation to engage in learning activities. We will, therefore, discuss how such motivation could be understood and supported by interactions.

2.2. Basic Psychological Needs

Students in the social environment of college can be motivated differently. One way to determine the type of motivation would be to look at the individuals' reasons for engaging in activities. According to the organismic theory of integration, these reasons for engaging can be placed on a continuum from low to high autonomy [1,21]. It suggests that students who are moved by external rewards or social approval are more externally controlled and thus less autonomously motivated.

On the other end of the continuum, autonomously motivated students look for intrinsic rewards by engaging in activities with personal importance or value. Hence, higher levels of autonomous motivation in contrast to controlled motivation, points to more intrinsic reasons for engaging in activities. Autonomously motivated students, therefore, experience their activities to be self-endorsed, enjoyable and rewarding in itself. In contrast, externally motivated activities are not seen as rewarding in itself, but merely as a requirement to achieve a goal. Beneficial effects for autonomously motivated students are various. For example, these students showed improved learning and engagement [22,23], effort and persistence [4,5], and increased competency and academic achievement [6,24,25].

As learning involves interaction and activities in the college environment, factors within that environment may support or diminish autonomous motivation. Factors determining whether autonomous motivation will be supported or undermined are described as basic psychological needs. Basic psychological needs are central to the self-determination theory (SDT) [1], a macro theory of motivation explaining how social conditions effect human engagement and flourish. SDT postulates that if the psychological needs are satisfied, adaptive functioning and well-being are increased, but when thwarted leads to maladaptive functioning and ill-being. The universal character of psychological needs implies that regardless of

students' gender or cultural background, the satisfaction or frustration of it, will either improve or diminish their sense of well-being and autonomous motivation [21,26].

SDT divides basic psychological needs into three categories: relatedness; autonomy; and competence. Relatedness requires warm and friendly relationships. In the context of college, supportive relationships make students feel trusted and secure enough to open up and share their anxieties and perspectives with others. [27]. When students experience openness and trust in relationships, they adopt a mindset of willingness to accept and internalize advice from teachers and become more adaptive in learning [28]. Autonomy refers to interest shown in students' choice and perspective on matters, making their learning more personal and meaningful to them [3]. In other words, the more students sense their interactions and activities to be personally relevant, the more ownership and intrinsically involved they will become [29]. Finally, competence improves students' efficacy and optimal skill development. It promotes feedback given to students which encourages them to adapt to new ways of thinking when facing challenges. These challenges, when matched to students' abilities scaffold their efforts to maximize growth [30,31].

A learning environment is seen as autonomy-supportive when it satisfies the basic psychological needs and avoids a controlling and evaluative atmosphere [32]. Many previous studies demonstrate the essential role of the teacher in an autonomy-supportive environment. For example, in circumstances with limited possibilities to meet student preferences, or when activities are less attractive, it is critical that students still interpret the teacher requests in an autonomy-supportive way [33]. Niemiec & Ryan [32] showed that students with a higher level of autonomy support demonstrated more initiative and volition to engage in activities they initially found less interesting. Another study showed that when teachers explained the importance of a particular learning activity, it supported students' interest and effort to study [34]. Various other studies revealed that students who perceive their teacher to be autonomy-supportive displayed improved wellbeing and persistence [28,35,36].

While these and the majority of other studies demonstrate the academic benefits of need-supportive teachers, few studies discuss need support by peers [37]. Furthermore, even less attention is given to how support for psychological needs is associated with students' daily formal and informal interactions with teachers and peers. Insight in these potential ways of need support might reveal new opportunities to improve students' involvement and success.

2.3. Rationale for the Hypothesized Model

This study examines how students' daily interactions linked to the concept of social and academic integration, is mediated through basic psychological needs, to support their academic success. For this reason, we propose a model that links the variables of both frameworks to each other and to academic success. Here, academic success is represented by the total number of credits point, with a maximum of 60 credits, that students can obtain in the first-year college. We assume that the more credit points students obtain, the more likely they are to persist.

Central to persistence is a successful integration, which requires students to perceive their interactions as meaningful and rewarding. This idea of a successful integration - when linked to the notion of SDT - implies that if the social exchanges in college support students' psychological needs, it will improve their autonomous motivation for learning. Here, the psychological needs are seen as indicators of meaningful and rewarding interactions. Therefore, if interactions support the satisfaction of psychological needs, and thus autonomous motivation, it follows that students will perceive their experiences to be more personally relevant and intrinsically rewarding. Also, as satisfaction of psychological needs is associated with favorable learning outcomes, we hypothesize that perceived need support will predict academic success.

Although we assume psychological needs to mediate between student interaction and academic success, it is still possible that direct links between the two may exist. With increased levels of formal interaction, such as involvement in intellectual communities and improved effort in learning, students' formal interaction might directly predict academic success.

Based on these theoretical underpinnings, this study hypothesizes that the sense of reward that comes with higher levels of social and academic integration will result in the satisfaction of psychological needs, which in turn supports academic success. The hypothesized model with the predictive paths between the variables of student integration, psychological needs, and academic success is depicted in Figure 1.
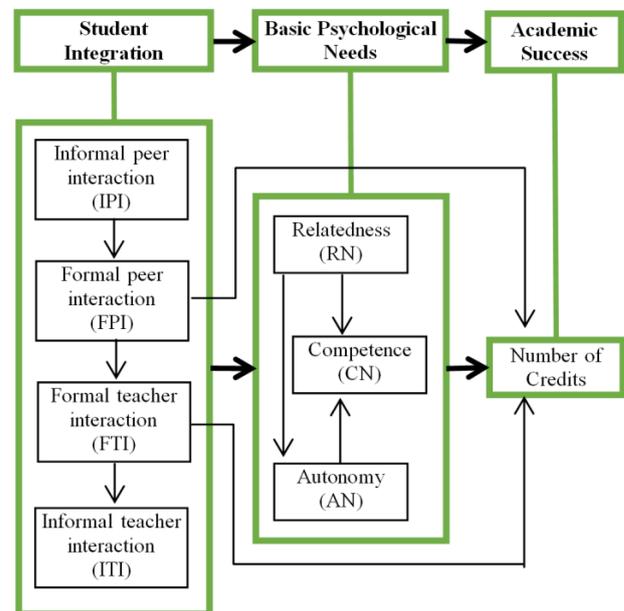

Figure 1. The hypothesized model

Based on the principles already discussed, we further assume certain mechanisms within each framework.

In the student integration framework, new students entering college, place great importance on building social relationships. Once these relationships are established, study-related issues are likely to be discussed within these social communities. We, therefore, assume students' informal peer interactions to predict their formal interactions with peers. Consequently, we expect students with higher levels of formal peer interaction - showing more involvement in

intellectual matters - to formally interact with teachers as well. Which, in turn, may improve their informal exchanges with the teacher.

With respect to the basic psychological needs framework, as all its components support students' autonomous motivation, we assume the associations between the needs to be positive. Consequently, we expect that relatedness, if supported by formal interactions with teachers and peers, to support students' sense of autonomy and competence. Additionally, we expect autonomy support in study-related matters to encourage students' involvement in learning activities and consequently improve their sense of competency.

3. Method

3.1. Data Collection

In the spring of 2017, first-year students of several universities of applied sciences in the Netherlands were asked by the head of the department to participate in an online survey. Students filled out a questionnaire on student integration (measured by the student interaction scales) and support for the three basic psychological needs (measured by the scales for relatedness, autonomy, and competence). Academic success was determined by the number of credit points obtained in first-year of college. Students who agreed to our request to share their credits score were e-mailed at the end of the academic year, in July 2017 and again in August 2017, to submit the number of credits. In total, 140 students, approximately a response rate of 15-20%, completed the questionnaire and provided the number of credits they had obtained. Students who did not complete the survey or did not share the number of credits were eliminated from the sample.

All students in the sample are enrolled in full-time first-year programs of non-residential colleges in The Netherlands. The age of these students varied between 17 and 30 years, with a median of 19, and 75% of the students not being older than 21 years.

Table 1. Respondents background, N=140

	N	%
Gender		
Male	78	56%
Female	62	44%
Total	140	100%
Ethnicity		
Majority	95	68%
Western Minority	6	4%
Non-Western Minority	39	28%
Total	140	100%
Ethnicity* Gender		
Majority Male	56	40%
Majority Female	39	28%
Minority Male	22	16%
Minority Female	23	16%
Total	140	100%

The respondents' background shown in Table 1 displays no big differences with the national population of first-year students of Dutch universities of applied sciences as reported by Statistic Netherlands (CBS) [38]. A comparison on gender shows that our study has 8%

more males in the sample than the 48% of the national population. Differences related to ethnicity shows that our sample consists of 32% of students with a minority background compared to 28% of the national population. According to CBS [38], students are considered a minority when one or both parents are born in a country outside The Netherlands.

Despite a low response rate, which may limit the representativity for all first-year students of the particular universities, we argue, that the similarities between the sample and the national population of first-year undergraduates, support the generalizability of the findings to larger groups comparable to the sample. Furthermore, we reason that respondents were probably the more motivated students completing the survey and providing access to their data. This possibly means that if we find differences in the factors between the more motivated students, these differences might even become bigger, as participation of less motivated students would further increase the variation in the sample.

However, the primary interest of this study is to find mechanisms between student interaction and basic psychological needs critical to academic success. For this purpose, path analysis has been conducted which considers a sample size of 140 students to be acceptable [39,40].

3.2. Measurement of the Constructs

Scales to measure students' formal and informal interactions with teachers and peers were developed and validated in previous studies within the Dutch context by Severiens and colleagues [6,8,41]. However, these interaction scales are rooted in previous research on social and academic integration in the US. For example, the peer interaction scale of Severiens and colleagues is similar to the social integration scale of Nora and Cabrera [20], which is based on the peer interaction scale of Pascarella and Terenzini [42], while the teacher interaction scale is similar to the academic integration scale of Berger and Milem [20]. Furthermore, the scales of Severiens and colleagues, follows Tinto's model, by making a distinction between formal and informal forms of integration.

Table 2. Scales with an item example and Cronbach's alphas, N=140

		Items	Cronbach's Alpha
1	Formal Teacher Interaction (FTI) Teachers have time to answer questions	7	.805
2	Informal Teacher Interaction (ITI) Teachers are not interested in my personal situation (reverse scored)	8	.699
3	Formal Peer Interaction (FPI) Fellow students invite me to work together on school tasks	8	.768
4	Informal Peer Interaction (IPI) I hardly know anyone here (reverse scored)	5	.850
5	Relatedness (RN) I feel that the people I care about also care about me	8	.791
6	Autonomy need (AN) I feel a sense of choice and freedom in the things I undertake.	8	.799
7	Competence need (CN) I feel I can successfully complete difficult tasks	8	.886

The basic psychological needs scales were developed and validated by Chen and colleagues [26] and used in several studies within different contexts [43,44]. Table 2 shows examples of the items of the interaction and basic psychological needs scales as well as the measure of the survey's reliability, the Cronbach's Alfa coefficient. Students rated each of the items of both constructs on a 7-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree).

3.3. Data Analysis

The distribution of the variables was checked on normality and outliers before further analysis of the data. The value for Skewness varied between -1.101 and .291, which is within the required range of ±3. The value for Kurtosis varies between -.830 and .183 which is within the allowed range of ±10 [45]. Two univariate outliers were detected with z-scores outside the range of ±3, and two multivariate outliers were identified with Mahalanobis distance with a p-value lower than .001 [45]. The cases containing the outliers were not removed as it occurred for two out of the eight variables, while the respondents' background showed no irregularities.

Related to the data analysis, first, a description of the statistics is provided through the mean and standard deviation of student interactions, basic psychological needs, and academic success. Next, Pearson correlations were applied to acquire a general impression of the main associations between the variables. Finally, path analysis was carried out to test the fit of the hypothesized model. The acceptable ranges for indices for a good model fit are, χ2 with p > 0.05, RMSEA less than .06, SRMR less than 0.08, and CFI greater than 0.95 [46].

4. Results

4.1. Descriptive Statistics

The descriptive statistics, the mean and standard deviation for student interaction, basic psychological needs, and academic success, are shown in Table 3.

Table 3. Descriptive statistics, N=140

	Mean	Std. Deviation
Informal Peer Interaction (IPI)	4.92	1.16
Formal Peer Interaction (FPI)	5.10	0.84
Informal Teacher Interaction (ITI)	3.58	0.90
Formal Teacher Interaction (FTI)	4.58	0.91
Relatedness Need (RN)	5.41	0.92
Autonomy Need (AN)	4.65	0.88
Competence Need (CN)	4.92	1.07
Credit Points	39.72	19.16

The findings in Table 3 indicate that first-year students are mostly involved in formal and informal interactions with peers (social interaction). Involvement with teachers (academic integration) is limited to moderate levels of formal interaction and low levels of informal interactions. Peer interactions are more likely to happen outside the classroom, teacher interactions are predominantly academic exchanges within the classroom setting.

Consistent with the higher levels of peer interaction, the basic psychological needs primarily show support for warm and friendly relationships (relatedness). In contrast, support for competence and autonomy seem to be experienced less often in the college environment. The limited support for autonomy need might indicate that students in general experience less volition in learning activities and therefore less autonomous motivation in the learning environment.

4.2. Associations

The correlations among the variables of both frameworks and academic success are presented in Table 4. The correlations among the variables of the constructs are all positive. The associations show patterns of relatively higher correlations between formal and informal peer interaction (r =.680, p <.01) (social integration) and relatedness (IPI r =.706, FPI r=.659 p <.01). Similarly, formal teacher interactions (academic integration) are most significantly related to informal interactions (r =.680, p <.01). Furthermore, formal teacher interaction shows the closest link with the psychological needs autonomy (r =.473, p <.01) and competence (r =.444, p <.01). The main connection between peer and teacher interaction, thus between social and academic integration, is shaped through formal interactions (r =.397, p <.01).

Table 4. The correlations among the variables, N=140

	IPI	FPI	ITI	FTI	RN	AN	CN
Informal Peer Interaction (IPI)	1						
Formal Peer Interaction (FPI)	.680**	1					
Informal Teacher Interaction (ITI)	.245**	.237**	1				
Formal Teacher Interaction (FTI)	.289**	.397**	.518**	1			
Relatedness Need (RN)	.706**	.659**	.240**	.347**	1		
Autonomy Need (AN)	.290**	.397**	.197*	.473**	.377**	1	
Competence Need (CN)	.247**	.347**	.173*	.444**	.232**	.527**	1
Credit Points	.036	.045	.014	.135	.010	.230**	.291**

**. Significant at the 0.01 level (2-tailed).
*. Significant at the 0.05 level (2-tailed).

The association from the perspective of the basic psychological needs shows that the needs are all positively associated with each other. It shows stronger links between autonomy and competence needs (r =.527, p <.01) and weaker links with relatedness (AN r =.377, CN r =.232, p <.01). Relatedness, in turn, is primarily associated with formal and informal interactions with peers (FPI r =.659, IPI r =.706, p <.01), whereas autonomy and competence needs, are mainly associated with study-related exchanges with teachers and peers. Here, stronger links were seen for teachers (AN r =.473, CN r =.444, p <.01) than for peers (AN r =.397, CN r =.347, p < .01). Furthermore, autonomy and competence need support showed to be the only significant links with academic success (AN r =.230, CN r =.291, p <.01).

The general picture drawn, basically supports the idea that warm and friendly relationships were mainly established through peers. This points to first-year

students concern to establish social integration prior to academic integration. Academic success, in turn, associated with support for autonomy and competence needs, showed to be indirectly linked to study-related exchanges with teachers and peers.

To get a more comprehensive picture of the associations between the constructs, we applied path analysis to test the hypothesized model with its predictive paths connecting the variables of both constructs to academic success.

4.3. Path Model

The hypothesized model, with the predictive paths linking student interaction to basic psychological needs and academic success, showed a good fit [46], $\chi2$ (5) = 3.165, P-value =.675, CFI = 1, RMSEA = .001, SRMR = .024. The significant paths between the frameworks of social and academic integration, basic psychological needs and student success are presented in Figure 2. The results of the path analysis confirmed informal peer interaction to predict formal peer interactions (βa = .68, p <.01), which then supported formal teacher interaction (βb = .40, p <.01), which consequently improved students' informal contacts with teachers (βc =.52, p <.01). Nevertheless, one needs to keep in mind that students are much more involved with peers than with teachers. For example, informal contacts with teachers were the least likely to occur.
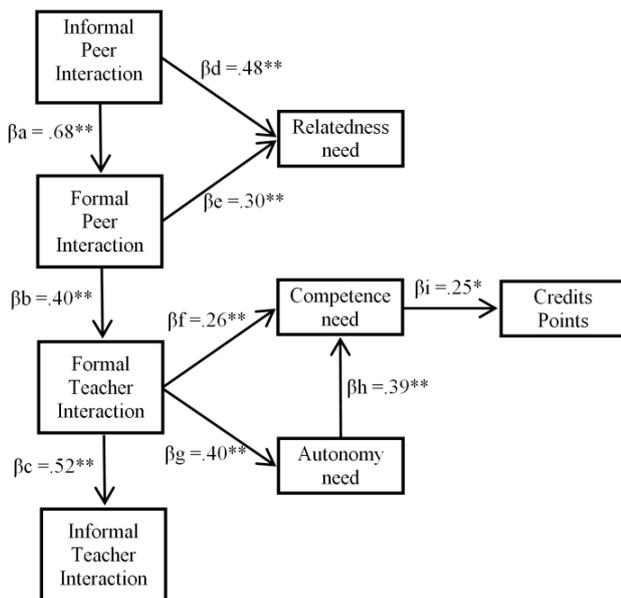
Figure 2. The significant paths between the variables, N=140 (**. Significant at the 0.01 level (2-tailed); *. Significant at the 0.05 level (2-tailed).)

The effect of student interaction on psychological needs shows that support for relatedness was directly predicted by formal (βe = .30 p <.01) and informal (βd = .48, p <.01) peer interactions (social integration), while support for autonomy (βg =.40 p <.01) and competence (βf =.26 p <.01) needs were only effected by formal teacher interaction. Indirect support for autonomy (βbg =.16 p <.01) and competence (βbf =.10 p <.01) from students' formal interaction with peers were small.

Although the correlations between the needs were all positive, a significant prediction was only seen between autonomy and competence needs (βh =.39, p <.01). In turn,

support for competence showed to be the only direct predictor of academic success (βi =.25, p <.05). Also, academic success was indirectly (βhi =.10 p <.05) predicted by autonomy support which in turn is supported by formal teacher interaction. Notable is that study-related exchanges with the teacher did not directly improve academic success, but only when mediated through autonomy and competence needs. Furthermore, it showed that among the different types of interactions, formal teacher interaction matters most for academic success.

5. Discussion

This study examined how students' daily interaction, linked to the concept of social and academic integration, is mediated through the basic psychological needs, to support academic success.

The findings show that support of the psychological needs by the daily interactions could be differentiated into support from peers for relatedness, and support from formal teacher interactions for autonomy and competence needs. The assumed intervening role of the psychological needs between student interaction and academic success was largely confirmed by the findings. However, each of the needs showed that different connections were established in students' path between daily interaction and academic success.

Support for relatedness did not serve as a mediator but indicated how well social integration improves close bonds with peers [2]. Relatedness being the best-supported need in the college environment confirms previous findings that first-year students prefer to establish peer relationships first, thereby attaining a sense of belonging to the social communities in college [12,13]. In contrast, autonomy support, intervenes between formal teacher interaction and competence need satisfaction, confirming previous findings [25,34] that support for skill development is further improved when teachers acknowledge students' choices and preferences in learning. Competence support showed to be the only mediator linking formal teacher interaction to academic success [6]. This finding also supports Tinto's view that formal teacher interaction in addition to being most central to classroom involvement is most essential to persistence [2].

However, the mediatory role of psychological needs shows that the findings are not entirely consistent with the central notion of student integration [2,14], which suggest a direct positive relationship between higher levels of social and academic integration and academic success. Such concerns of inconsistency between student integration and persistence were often addressed by pointing to differences in the type of institution, gender, ethnicity or operationalization of the constructs of social and academic integration [18,20,26].

However, the findings of this study add the perspective that prediction of persistence by observing social and academic integration might be improved when the content, of what and how it is, discussed in these relationships, is linked to the autonomy-supportive needs of students. Since need support facilitates intrinsically rewarding learning experiences which benefits positive learning outcomes, including academic success [3,5,24]. We,

therefore, argue that positive experiences of autonomy, competence, and relatedness can be interpreted as intrinsic rewards [2] that students are looking for in relationships which enables them to successfully integrate into the college communities improving their changes to persist. On the other hand, negative experiences hinder the integration process and make students more prone to withdraw from college.

The critical role of teachers in our findings is consistent with previous studies [28,36]. However, this study showed that peers' important contribution to relatedness improves students' formal interaction with teachers, thus increasing chances to receive further support for autonomy and competence needs. These findings, therefore, point to the importance of need support by peers, which is less emphasized by self-determination theory.

The findings of this study that are related to the levels of integration, need support or student success should be considered with the following limitations. First, its generalizability is limited to first-year student populations belonging to non-residential colleges similar to the sample. Second, as this study was conducted in the spring of 2017, it, therefore, did not include those students who left college in the first semester of the academic year.

6. Conclusion

The combination of the concepts of student integration and basic psychological needs has two main beneficial effects.

First, the combined model shows that the concept of student integration structures the daily interaction in the college environment, while the concept of psychological needs interprets these interactions, and indicates its benefit for students' determination for learning and success. This complementing effect of the concepts enabled us to display what pathway new college students are likely to follow going from daily interactions with peers toward persistence and academic success. This pathway then clarifies what connections between the concepts if established, supports their involvement and success in college.

Second, while Tinto's model provides a limited explanation on how students' perception of meaningful and rewarding interactions is defined, the present study suggests that the psychological needs framework can be successfully applied for this purpose. Moreover, it explains why and what type of daily interactions is most likely to benefit students' autonomous motivation and success. From the perspective of SDT, this study not only confirms the importance of a need-supportive learning environment but also adds to the findings that need support can be differentiated into formal and informal interactions with teachers and peers.

In summary, with the insights acquired by integrating both concepts, this study seeks to contribute to the understanding of the relationship between students' daily interaction, integration, motivation and success in college. The findings of this study may, therefore, be applied to guide new students' formal and informal involvement in college and provide an autonomy-supportive way towards persistence. Follow-up studies could examine the differences in the association between daily interactions,

psychological need support and learning outcomes of minority and majority students. Additionally, students' withdrawal may be divided into forced and voluntary types of departure from college.

Statement of Competing Interests

The authors have no competing interests.

List of Abbreviations

SDT   Self-determination theory
IPI   Informal peer interaction
FPI   Formal peer interaction
ITI   Informal teacher interaction
FTI   Formal teacher interaction

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