2-Liga

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Revision of the Student Adaptation to College Questionnaire (SACQ) for Use with Italian Students

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ABSTRACT

Background: This multistudy report was aimed at examining the psychometric properties in the Italian context of the Student Adaptation College Questionnaire (SACQ) that represents the most important self-report measure for assessing how students adjust to university.
Methods: Three studies were conducted in order to revise and improve the instrument for being more efficient in measuring adjustment to university.
Results: The final result was the SACQ-SF consisting in 12 item assessing three dimensions: a) student's perception of one's study skills (Studying); b) student's sense of satisfaction with courses and programs (Satisfaction with curriculum); c) student's evaluation of the degree to which he has social skills and is making new friends (Social adjustment).
Conclusions: Convergent and construct validity may be considered also adequate. In sum, the SACQ-SF can be considered a promising valuable and efficient instrument in measuring adjustment to university in the Italian context, and probably in the European one too. Further, as a brief instrument, it can be easily administered and used as a quick screening tool.

Keywords: *SACQ, Validation Study, Confirmatory Factor Analysis, Validity Construct*

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Introduction

There is a great body of evidence that attending university for the first time may represent a stressful experience for many young people. As Dyson and Renk (2006) has outlined the transition from high school to the university falls in the so-called emerging adulthood phase (Arnett, 2000) when individuals meet new social and personal challenges, generally relating to a redefinition of identity and to the subsequent exploration of novel roles and responsibilities in different dimensions (family; peer relationships; romantic relationships) as well as to the acquisition of those skills necessary to undertake future working career.

In this composite context moving to an unfamiliar milieu as university life can jeopardize the sense of self efficacy, security and acceptance previously developed and ask for a more complex level of adjustment.

From a psychological point of view, adjustment refers to those behaviors that allow each individual to deal with an array of environmental demands and expectations and requires several coping strategies (Fernandez, Araujo, Vacas, Almeida, & Gonzales, 2017). In particular, adjustment to the university may be defined as how well students are able to manage new behavioral, cognitive and affective patterns of responses in a highly competitive setting; to adapt to the more flexible academic schedule, to discover and negotiate different social network and to feel committed to the educational and institutional purposes.

The individual ability to perform these tasks seems to be crucial to achieve personal goals and needs and to accomplish in a positive way the academic path (Credé & Niehorster, 2012; Larson & Bell, 2013). Some young people are able to easily cope with these tasks; some others are overwhelmed by the changes they go through and develop a psychological fragility and deseases.

They may experience some problems including depression, loneliness or substance abuse that can lead to dissatisfaction and disengagement. It seems that students drop-out of university is often due to their failure in adjusting to university life (Rodriguez, Tinajero, Guisande & Paramo, 2012; Van Rooij, Jensen, & Van de Grift, 2017).

Students often report-that they are faced with many stressors, such as academic workload or financial issues, which may negatively affect their psychological well-being and may interfere with their daily functioning at university, increasing the likelihood that a student withdraws for non academic causes and leave the institution (Winter & Yaffe, 2000).

Concern about the manner in which students may navigate these challenges is reflected in the guidance programs and counseling services offered by many universities. For this reason, it

becomes essential to identify students who could potentially benefit from interventions during the first year of college and to support their difficulties.

The Student Adaptation College Questionnaire (SACQ) represents the most important self-report measure for assessing how students adjust to university. The instruments developed by Baker and Siryk (1984, 1986, 1989) included 67 items rated on a 9-point scale. It consisted of 4 subscales which measured 4 specific areas: (a) *academic adjustment* subscale (24 items) reflecting the degree to which students have adapted to their academic demands; (b) *social adjustment* subscale (20 items) reflecting the students' success in the interpersonal relationships inherent university life; (c) *personal-emotional adjustment* subscale (15 items) reflecting the degree to which students are experiencing distress (e.g., anxiety or stress) for the demands of university environment; (d) *institutional attachment* subscale (15 items) reflecting the quality of the relationship between the student and the institution and the commitment that the young adult feel towards university as institution. Literature (Beyers & Goossens, 2002; Credé & Niehorster, 2012; Taylor & Pastor, 2007) put in evidence how the SACQ has been used to serve a variety of purposes: to capture signs of problems in adjustment to university of first-year students; to measure the results of counseling or guidance programs; to evaluate the construct validity of newly developed measures of academic and social satisfaction.

Even thought this instrument has been used in several studies and the results reported are strongly consistent as regards internal consistency and predictive and concurrent validity, one of the critical weakness of the scale is its internal structure that does not appear to confirm the model proposed by Baker and Siryk (1989). Taylor and Pastor (2007) demonstrated that the four-factors model was able to explain less than half of the total variance in items indicating that more than half of the total variance among items was unexplained by the factors. The authors suggested that a two-factors solution or a different four-factors alternative solution best represent the data, even if they did not examine these solutions. They also rejected the one-factor models for each of the subscales indicating that the assignment of items to subscales should be considered in future studies. Indeed, they show that no information was provided by Baker and Siryk referring how items were developed for the commercially available 67 items version or why two items contribute only to full-scale score and not to any subscales.

In line with these considerations, Feldt et al. (2011) observed that more than 20 items failed to reach criterion and items 14 and 17 loaded on more than one factor. Thus, they indicated a six-factor solution differentiating the academic adjustment subscale into two components, one related to studying and the other to academic performance, and the attachment subscale into

two components too, that is the adjustment to being a college student and the perceptions of fit to a specific institution.

Results concerning the factor structure appeared also inconsistent in several studies conducted in Europe with Belgian, French, Portuguese and Spanish samples (Beyers & Goossens, 2002; Carayon & Yves-Gilles, 2009; Rocha & Matos, 2008; Rodriguez et al., 2012). The dimensionality of the scale resulted to be problematic when more flexible fit criteria were considered. Overall, these studies proposed a shortened version of the instrument considering that some items were recommended to be eliminated because the factor loadings associated with the factors resulted low or because they loaded on multiple factors. The modification in the adapted versions for European samples were partly necessary also for the differences in organization of USA and European universities as regards the mode of access recruitment/enrollment or the higher percentage of European students who live at home. Finally, authors point out that an instrument developed 20 years ago may not reflect the current understanding of a student's adjustment to university and that a simpler version of the scale could be more efficacy in measuring adjustment to university.

So, beyond cultural and contextual differences, authors have generally underlined the potential usefulness of the SACQ, but they have contextually revealed the need to revise the scale. They expressed a common agreement on the importance of an additional theoretical and empirical research to improve the instrument

Taking into account these considerations, the general purpose of this research was to adapt the SACQ to the Italian cultural context. Three studies are presented:

- Study 1 - we administered the original SACQ to a sample of Italian college students and we tested its factorial structure;
- Study 2 - we used the technique of focus group to derive a shorter and revised form of the SACQ able to capture better the meaning of adjustment for Italian students;
- Study 3 - we administered the SACQ-SF to a new sample of Italian college students and we tested its factorial structure, reliability and construct validity.

Study 1

The purpose of the first study was to investigate the factorial structure of the original SACQ in the Italian cultural context by examining the four-factor model hypothesized by Baker & Syrik (1989), and evaluating the unidimensionality of each subscale.

Method

Participants/Subject

The first sample was composed of 730 Italian first-year students (42% male), ranging in age from 18 to 47 years (M = 19.62 years, SD = 2.34) attending Universities of Palermo and Messina: 46% Psychology, 50% Economics, 4% other courses. Thirty-six percent of the students were non residential, 34% were residential and lived at home with at least one parent, 10% were commuter. All students were attending the first semester. All participants were Caucasian.

Procedure and Measures

This study was approved by the Institutional Review Boards (IRB) of the University of Palermo and Messina and it was conducted in conformity with the guidelines for the ethical treatment of human participants of the Italian Association of Psychology. Participants took part at the research voluntarily and anonymously, and they did not receive any compensation. Prior permission was obtained from each participant, from the university dean, and from the course professors involved. The scale was administered collectively during class sessions under the supervision of four psychology undergraduates and it took no longer than 15 minutes to complete. In addition to the written instructions accompanying the questionnaire research assistants provided verbal instructions. The same procedure was employed in subsequent studies.

Items of the SACQ were translated by a forward and backward translation design (Hambleton, 2005). The process of forward translation from the original SACQ version (English) to the target language (Italian), involved all the authors, who were native Italian. An independent translation was produced by each translator. Subsequently, these translators participated in a synthesis meeting in which they discussed the differences among their translations trying to reach a consensus and developing a synthesized translation of the scale. During the meeting, translators paid close attention to cultural nuances and their effects on the translation at the word, sentence, and discourse level. Finally, a separate translator, who was blind to the original questionnaire, back translated the synthesized version of the Italian SACQ into English. She was a native English-speaking professor, who teaches Italian at the university level. The resulting version was administered to an independent sample. We presented these results in the Study 1.

Results

Descriptive Statistics for the Original SACQ Items. The mean, standard deviation, skewness, and kurtosis of the SACQ items are given in Appendix A. The data had a normal univariate distribution, the skewness and kurtosis values being approximately in the range -1.0 and +1.0 (Muthén & Kaplan, 1985), with the exception of items 5 ("I know why I am in college and what I want out of it"), 23 ("Getting a college degree is very important to me"), and 44 ("I am attending classes regularly") of academic adjustment subscale, and 47 ("I expect to stay at college for a bachelor's degree") of institutional attachment subscale. Inter-item correlations ranged from .01 to .64 in absolute value.

Factorial Structure of the Original SACQ. A series of confirmatory factor analysis (CFA) were used to assess the original SACQ factorial structure. First, we tested the four-factor model hypothesized by Baker and Siryk (1989). Second, we tested four separate one-factor models, one for each subscale in order to sound their unidimensionality. CFAs were performed on a covariance matrix using Mplus 7 (Muthén & Muthén, 1998-2012). The maximum likelihood estimation method was used to test the models. In addition, robust statistics were used to account for the multivariate non normality of variables (normalized estimate of Mardia coefficient = 7.80, $p < .001$). The Satorra–Bentler scaled χ^2 test statistic (SBχ^2) and robust comparative fit index (CFI; Satorra & Bentler, 1994) were included to adjust standard errors to calculate parameter estimates in situations where multivariate normality cannot be assumed. A number of goodness-of-fit indexes were used to assess the fit of the model. The scale of the latent variables was determined by fixing at 1.0 their variances. All tested models had a poor fit to the data; the goodness of fit indexes are reported in Table 1.

	SB χ^2	df	CFI	RMSEA	RMSEA 90% CI
Four-factor model (65 items)	8624.58***	2,000	.624	.067	.066-.069
One-factor model for academic adjustment (24 items)	1985.49***	252	.530	.097	.093-.101
One-factor model for social adjustment (20 items)	1776.45***	170	.602	.114	.109-.119
One-factor model for personal adjustment (15 items)	711.71***	90	.790	.097	.093-.100
One-factor model for institutional attachment (15 items)	1147.70***	90	.727	.127	.120-.133

Table 1- Goodness of fit indexes of models run on the original SACQ items in Study 1 (n = 730)

Study 2

The study 1 did not lead support to the four-factor model of the SACQ. The need to revise the scale in its dimensions was probably due to the different significance of university adjustment for Italian students. Many items are factorially complex and others may resulted redundant or of little importance in the context of Italian university students.

So, the current study was aimed at developing a new and shorter version of the SACQ by selecting, improving and refining items of an existing instrument by focused group discussions as proposed by Nassar-McMillan and Borders (2002). In order to improve the psychometric properties of the scale, in a preliminary phase we also omitted items belonging to the Personal-emotional Adjustment scale considering that this aspect may be evaluated by other defined and largely validated instruments developed to specifically measure this dimension.

Participants/Subject

Participants of the focus groups were 24 young adults (12 males) of the University of Palermo (Italy), ranging in age from 18 to 22 years ($M = 20.22$ years, $SD = 0.75$), which serves a middle class community. Four groups were conducted each composed by 6 participants and homogeneous for sex. Focus group participants did not constitute a random sample according to the practical necessity of conducting the groups locally. Nonetheless, they were representative of the population of our interest (Stewart & Prem, 2015).

Procedure

Focus groups with university students were conducted with the aim to analyse items from SACQ, for selecting items thought significant in order to catch the multidimensional nature of the university adjustment and for eliminating those considered not salient for the aim of measuring the construct. Contextually, participants to focus groups had the possibility to generate additional items useful for evaluating specific aspects neglected in the actual version of the SACQ.

Results

Conduction of Focus Groups. A definition of university adjustment was used by the moderator to start the conduction of the groups. Each participant received 50 cards, one for each item of the actual version of the SACQ, and they were asked to read them, and to decide (individually) whether or not they were useful in order to measure students' adjustment to university. They were also asked to put the cards in 3 separate baskets: one for "yes" items (if they could be maintained); one for "no" items (if they could be eliminated), and a last for "yes, with revisions" items (if they could be maintained but only modifying them with different terminology). When

participants finished to place all the cards in the baskets, the researcher and the moderator ensured the counting of them in order to identify those on which focus the discussion. The items that received at least 4 "no" were deleted and not discussed as well as the items that received at least 4 "yes." Items that received different assessments (e.g., 3 "no" and 3 "yes") as well as judged as characterized by the need for revision were discussed by participants to be modified or combined. The idea was to go beyond simple "yes" and "no" responses to better understand the thoughts and perceptions of the students, and to achieve a balance between qualitative and quantitative data (Krueger, 1994).

Development of a Revised and Short Scale Version. Once done all the focus groups, we selected items from the original list using feedback, according to the following procedure: a) the items with 4 or 3 answers "yes" were maintained; b) the items that received the answers "no" in more than 2 focus groups were deleted from the list, based on the idea that if the most of the groups agreed on its salience, the behavior was not representative; c) the items with 2 answers "yes" and 2 "no" were analyzed closely going to examine and understand the logic of the decisions for the "yes" and "no" taken by the groups.

We also took in consideration the feedback given by participants about the items in terms of their comprehensibility and relevance.

Using these criteria, some items were recommended to be omitted because they were considered unfitting for the cultural background of Italian context in which only the minimum percentage of student do not live at home (e.g., '*I enjoy living in a college dormitory*' or '*Lonesomeness for home is a source of difficulty for me now*'). Some others were just evaluated as redundant or easily misunderstood or the concept was of limited meaning (e.g., '*I have been feeling lonely a lot at college lately*' or '*I have had informal personal contacts with college professors*').

Furthermore, the subscale 'Institutional Attachment' was completely removed because some items were too much similar to items belonging to the subscale 'Social Adjustment' (e.g. '*I am having difficulty feeling at ease with other people at college'* or '*I am quite satisfied with my social life at college'*) and the other ones were evaluated irrelevant in measuring the construct (e.g., '*I am pleased now about my decision to attend this college in particular'* or '*I wish I were at another college or university*').

At the end of this process, 12 items developed and used by Baker and Siryk (1989) were retained based on focus groups recommendations with slight alterations to a few items. The focus groups participants did not suggest the addition of any items to the scale, but they reinforced the idea to have a shorter scale easily to be administered. The three main aspects

remarked by participants for understanding adjustment to university and consequently for measuring the construct were the following: a) student's perception of one's study skills (Studying) ; b) student's sense of satisfaction with courses and programs (Satisfaction with curriculum); c) student's evaluation of the degree to which he has social skills and is making new friends (Social adjustment). The proposed SACQ-SF is presented in Appendix B.

Study 3

The aim of the study 3 was to examine the psychometric properties of the SACQ-SF firstly investigating the hypothesized three-factor structure of the scale through an exploratory and a confirmatory approach, using two independent samples of college students. Secondly, the SACQ-SF internal consistence was tested. Finally, we investigated the scale construct validity, examining whether scores on the SACQ-SF subscales showed patterns of associations consistent with theoretical accounts of academic adjustment and prior empirical studies. Extensive prior research had shown that the SACQ had specific links with a range of psychosocial processes. So, we examined each subscale in terms of its interrelations with measures of student's wellbeing and individual characteristics, such as self-efficacy and motivation, which can provide further evidence of validity. High levels of adjustment to university were hypothesized to be positively associated with student's self efficacy and academic motivation likewise with student well-being, and negatively associated with student's loneliness.

Method

Participants/Subject

The first sample was composed of 211 Italian first-year students (34% male), ranging in age from 18 to 24 years (M = 19.41 years, SD = 1.06). Participants attended several courses at the University of Messina: 49% Psychology, 47% Economics, 4% other courses. Fifty-eight percent of the students were non residential, 32% lived at home with at least one parent, 10% were commuter. All participants were Caucasian.

The second sample was composed of 205 Italian first-year students (34% male), ranging in age from 18 to 24 years (M = 19.52 years, SD = 1.10). Participants attended several courses at the University of Messina: 47% Psychology, 45% Economics, 7% other courses. Fifty-five percent of the students were non residential, 35% lived at home with at least one parent, 10% were commuter. All participants were Caucasian. The same procedure of Study 1 was used.

Procedure and Measures

Academic adjustment. Participants were administered the 12-item SACQ-SF (see Table 3). Participants were asked to indicate the extent to which each item described them on a 4-point Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree).

College Adjustment Questionnaire. The College Adaptation Questionnaire (CAQ; Crombag, 1968) consisted of 18 items assessing perceived level of general adjustment to university. Ten of the items showed poor adjustment (e.g. "*I find it hard to get used to life here*"); eight items showed positive adjustment (e.g. "*I am glad that I came to study here*"). The score for the CAQ is the sum of the item scores after reverse coding the 10 'poor adjustment' items; high scores on the CAQ represent higher adjustment to university. In the current study, reliability of the CAQ was good (α = .81)

Self-efficacy. The General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995) comprises 10 items assessing self-efficacy. An example item is, "*I can always manage to solve difficult situations if I try hard*". Participants rate their responses using a 4-point Likert scale ranging from "not at all true" to "exactly true". The total score is calculated by finding the sum of the all items. For the GSE, the total score ranges between 10 and 40, with a higher score indicating more self-efficacy. In the current study, reliability of the scale was good (α = .81).

Academic Motivation. The Academic Motivation Scale – College Version (AMS-C 28; Vallerand et al., 1992; Italian version by Alivernini & Lucidi, 2008) consisted of 28 items to assess the quality or type of students' motivation. It is based on the Self-determination theory (SDT; Deci et al., 1992; Ryan and Deci, 2000) that basically distinguishes two types of motivation: intrinsic and extrinsic, and a state called "amotivation'', signifying a lack of motivation. The scale showed excellent internal consistency (alpha = .78). Students answered all items on a 5-point Likert-type scale ranging from "not at all true" to "exactly true".

Loneliness feelings. Participants were administered the UCLA Loneliness Scale (Russell et al. 1980). This scale measures loneliness conceptualized as a unidimensional emotional response to a discrepancy between desired and achieved levels of social contact and consists of 20 items measured on a 4-point Likert scale ranging from 1 (never) to 4 (often). Examples of items include ''I am no longer close to anyone'' and ''I lack companionship.'' In the present study, the, reliability of the scale was good (alpha = .81)

Psychological well-being. Participants were administered the shortened version of the Psychological Well-Being Scale (PWS; Ryff, 1989; Ryff & Keyes, 1995). This scale consists of 18 items articulated in 6 three-item subscales designed to measure 6 subscales of psychological well-being: (1) autonomy (e.g., "I can make a choice easily") refers to independence and self-determination; (2) environmental mastery (e.g., "I am quite good at

mastering the many responsibilities of my daily life") refers to the ability to manage one's life; (3) personal growth (e.g., "For me, life has been a continuous process of learning, changing, and growth") refers to being open to new experiences; (4) positive relations with others (e.g., "People would describe me as a giving person, willing to share my time with others") refers to having satisfying high quality relationships; (5) purpose in life (e.g., "I have given up trying to make big improvements or changes in my life", reverse) refers to believing that one's life is meaningful; and (6) self-acceptance (e.g., "I like most aspects of my personality") refers to a positive attitude towards oneself and one's past life. Participants were asked to indicate the degree of agreement with each statement on a 7-point scale (1=a very bad description of me; 7 = a very good description of me). In the present study, the subscales had adequate internal consistency (alpha = from .77 to .85).

Results

Descriptive Statistics for the SACQ-SF Items. The mean, standard deviation, skewness, and kurtosis of the SACQ-SF, and Pearson's correlation coefficients for sample 1 and 2 are given in Table 5. The data had a normal univariate distribution in both samples, the skewness and kurtosis values being approximately in the range -1.0 and +1.0 (Muthén & Kaplan, 1985). Inter-item correlations ranged from .01 to .65 in absolute value for sample 1, and from .01 to .61 in absolute value for sample 2.

	bsacq1	bsacq2	bsacq3	bsacq4	bsacq5	bsacq6	bsacq7	bsacq8	bsacq9	bsacq10	bsacq11	bsacq12
bsacq1	1	.403***	.420***	.614***	.090	.193**	.089	.141*	.143*	.127	.242**	.200**
bsacq2	.354***	1	.423***	.468***	.061	.242**	.055	.197**	.280**	.182**	.300***	.185**
bsacq3	.487***	.447***	1	.416***	.303***	.218**	.152*	.292**	.129	.198**	.282***	.171*
bsacq4	.553***	.290***	.358**	1	.062	.075	-.009	.144*	.069	.134	.210**	.129
bsacq5	.034	.172*	.285**	.052	1	.380**	.407**	.516**	.234**	.171*	.129	.248**
bsacq6	.146*	.202**	.287**	.163*	.476**	1	.346**	.573**	.247**	.025	.167*	.243**
bsacq7	.049	.086	.246**	.105	.510**	.505**	1	.485**	.160*	-.002	.096	.125
bsacq8	.108	.252**	.358**	.165*	.553**	.694**	.620**	1	.162*	.014	.179*	.184**
bsacq9	-.098	.178**	.073	-.111	.198**	.291**	.194**	.310**	1	.365**	.383**	.434**
bsacq10	.040	.275***	.277**	.089	.326**	.386**	.237**	.467**	.391**	1	.571**	.513**
bsacq11	.012	.247**	.262**	.110	.291**	.401**	.205**	.383**	.444**	.629**	1	.485**
bsacq12	.102	.325**	.294**	.133	.268**	.349**	.255**	.447**	.331**	.652**	.540**	1

*$p < .01$, **$p < .01$, ***$p < .001$.

Table 2 - Mean, standard deviation, skewness and kurtosis of the SACQ-SF items, and Pearson correlation coefficients in Study 3, for sample 1 (n = 211, below the diagonal) and Sample 2 (n = 204, above the diagonal)

Exploratory Factor Analysis on the SACQ-SF. An Exploratory Factor Analysis (EFA) was conducted to examine the factor structure of the SACQ-SF in sample 1. We performed the principal axis factoring, and the extracted factors were rotated obliquely. Accordingly to the theoretical considerations and the empirical criterion of the random data parallel analyses (Horn, 1965), a three-factor solution was chosen. The eigenvalues derived from the actual data were compared to the eigenvalues derived from the random data. Factors were retained as long as the eigenvalue from the actual data was greater than the eigenvalue from the random data (O'Connor, 2000). Both Kaiser's (1961) criterion (items with eigenvalues ≥ 1) and the scree test (Cattell, 1966) were secondarily checked for agreement. Appendix C shows the factor pattern matrix. The three-factor solution explained 52.86% of the total variance in the data before rotation. There was no cross-loading among the items (cross-loadings ranged from .01–.18), and all factor loadings were higher than .40. All items saturated in the expected factors. Correlations between factors ranged from .19 to .51.

Confirmatory Factor Analysis of the SACQ-SF. A CFA based on examining the covariance matrix using Mplus 7 (Muthen & Muthen, 1998-2012) was performed to test the hypothesized three-factor structure of the SACQ-SF. This model was evaluated allowing each item to load on the hypothesized factor and setting all other factor loadings at zero. Factor covariances were free parameters to be estimated. To establish the measurement scale of each factor, their variance was fixed at 1.0. Since items exhibited a multivariate non-normal distribution (the normalized Mardia's coefficient was 39.81, $p < .001$), the robust maximum likelihood estimation method was used, which adjusts standard errors of parameter estimates and chi-square statistics ($SB\chi^2$) to account for non-normality (Satorra & Bentler, 1994). Goodness of fit indexes showed that the model generally fitted the data well: $SB\chi^2$ (51) = 64.34, $p = .10$, robust CFI = .977, RMSEA = .037. All parameters were significant.

Intercorrelations between the SACQ-SF and Other Study Variables. In order to examine the association between the SACQ-SF factors and other study variables, Pearson correlation coefficients were computed. Results are reported in Table 6. Academic adjustment as assessed by the CAQ, psychological well-being and intrinsic motivation were positively and significantly correlated with the SACQ-SF factors. Self-efficacy was positively and significantly correlated with Studying and Social adjustment. Loneliness was negatively and significantly correlated with Studying and Social adjustment. Extrinsic motivation was positively and significantly correlated with Social adjustment and Satisfaction with curriculum. Amotivation was negatively and significantly correlated with Studying and Satisfaction with curriculum.

	Studying	Social adjustment	Satisfaction
Academic adjustment (CAQ)	.616**	.525**	.402**
Self-efficacy	.189**	.185**	.087
Loneliness	-.312**	-.350**	-.135
Psychological well-being	.387**	.292**	.227**
Intrinsic motivation	.243**	.211**	.281**
Extrinsic motivation	-.048	.237**	.183**
Amotivation	-.469**	-.080	-.264**

*$p < .01$, **$p < .01$, ***$p < .001$.

Table 3 - Correlation coefficients among the SACQ-SF factors and study variables in Study 3 (sample 2, n = 204)

Discussion

The general purpose of the present study was to examine the psychometric properties of the SACQ in the Italian context, investigating its dimensionality, reliability and construct validity. Three studies were realized to achieve this goal: (a) Study 1 was focused on the exploration of the scale dimensionality and reliability; (b) Study 2 was focused on focus groups procedure to derive a shorter and revised form of the scale; (c) Study 3 was focused on the confirmatory analysis of the short form of the scale.

Globally, the results suggested that the dimensionality of the scale appears problematic putting in doubt that the actual version of the SACQ may be an efficient instrument for diagnosing maladjustment or identifying students in need of services in the Italian context as questioned by several previous studies (Feldt et al., 2011; Rodriguez et al, 2012; Taylor and Pastor, 2007). In particular, the original four-factor model and the unidimensionality of each subscale were tested using CFA. All the tested models showed a bad fit to the data. In sum, our attempts to identify a plausible factor structure for the SACQ items were unsuccessful.

The inconsistence of the original scale evinced by our results may be due to the differences in the educational background between the target population and the researchers who have generated the scale, such as the organization of US and Italian university contexts or the higher percentage of students who live at home. Furthermore, the theoretical distinction between Social Adjustment scale and the Institutional Attachment scale resulted also warranted in previous studies which showed the strong correlation between the two subscales suggesting some level of construct redundancy (Credé & Niehonster, 2012; Taylor & Pastor, 2007).

In order to make items contents more appropriate for measuring adjustment to university considering youths' experiences and cultural aspects of the target population, focus groups were employed. Focus groups discussions give indeed the possibility to explore the way in which potential respondents think about an issue and contextually to improve items in a new, more adequate and suitable version. The most of the items of the original scale were considered unfitting or redundant, so their removal from the scale was recommended. The items considered appropriate to describe and measure the construct of adjustment to university belonged to the subscales of 'Academic Adjustment' and 'Social Adjustment' and were maintained as they were. Only 2 of these items were modified in their terminology, and improved from the discussions and the suggestions during the study. The result of the method was a 12 item-scale in which three dimensions seemed to be relevant: a) student's perception of one's study skills (Studying) ; b) student's sense of satisfaction with courses and programs (Satisfaction with curriculum); c) student's evaluation of the degree to which he has social skills and is making new friends (Social adjustment).

These finding suggested how Italian students considered the concept of university adjustment strictly related to academic and social experiences. They also confirmed that being socially involved represented a key factor for students in reaching a higher level of adjustment beyond the cultural background. This is in line with previous literature indicating that students who have greater new social support networks adapt better to the foreign situations they face in college (Tinto, 1993; Torres & De la Cruz, 2015)

Finally, we tested the three-factor model of the SACQ-SF and its internal consistency. Both exploratory and confirmatory factorial analysis provided evidence for this model and SACQ-SF seemed to assess three different but related dimensions. This three-factor solution explained more than half of the total variance and there was no cross-loading among the items. Furthermore, findings regarding convergent and construct validity showed to be convincing. Highly significant correlation was found with a well-established questionnaire like as the CAQ (Crombag, 1968) that provide an alternative measure of student adjustment. The SACQ-SF seemed to have specific links with a range of psychosocial processes. All the three factors are positively related to the student's psychological well-being and intrinsic motivation. In particular, students who perceive themselves able to face the new academic aims and to be engaged in social activities showed high levels of self-efficacy and low levels of loneliness. Additionally, students who feel themselves satisfied for the courses and the programs offered by the own university reported high levels of extrinsic motivation.

Conclusion

To conclude, the SACQ-SF appears to be a valuable and efficient instrument in measuring adjustment to university in the Italian context, and probably in the European one too. Such actions aimed at revisiting the original scale and improving its psychometric properties are consistent with the others carried out or suggested in previous studies (Carayon & Gilles, 2005; Feldt et al., 2011; Taylor and Pastor, 2007).

Despite some limitations, our study contributes to the literature because performs a revisiting process of the structure of this scale providing a short measure appropriate for capturing a multifaceted view of university adjustment. Theoretically, it contribute to better understand university adjustment in a different context like the Italian one. Further, as a brief instrument, the SACQ-SF can be easily incorporated into counseling services settings and used as a quick screening tool in order to individuate students at risk of retention. Notably, a brief version could be suitable in studies where large batteries of instruments are proposed to reduce administration time and participants' lack of motivation (Meriac, Woehr, German & Thomas, 2013).

From a practical point of view, understanding the influence of certain variables on the successful transition to university may lead the development of an institutional support system able in lowering the attrition rates. It is important to develop orientation programs above all for first-year students who should have the possibility to easily know about the services offered and how to obtain them. In this perspective, universities as education institutions have a great responsibility towards their students considering that in the Italian context only the 22.3% of youths from 25 to 34 years complete university and more than 56.8% of students fail to complete it and much of this attrition (approximately 20%) occurs in the first year (ISTAT, 2017; Sica, Sestito & Ragozini, 2014).

Limit of the research and future prospective

The present finding should be interpreted in light of the study limitations that are important to note. First, participants to study are from Sicily, a southern region of Italy. Hence they are not representative of the whole country, especially considering that in southern Italy students may be more socially dependent than in other contexts. Future study should try to generalize these results to different samples. In further studies, it would be important to test the three-factors structure stability and the measurement invariance of the 12-item solution in additional Italian academic contexts or with reference to difference targets (e.g., gender or age groups) to interpret potential differences. Moreover, considering that our study comprised relatively

homogeneous samples of well-educated and white emerging adults, future research should involve participants from different socioeconomic and cultural backgrounds (SES, ethnicity and educational level) given

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Authors' contribution

Liga F. assisted with the generation of the initial draft of the whole manuscript, manuscript editing and data interpretation; Ingoglia S. assisted with concept, study design, data analysis, manuscript preparation and manuscript editing; Lo Cricchio M.G. assisted with manuscript editing and study concept; Liga F. and Lo Coco A. assisted with manuscript editing, data analysis, data interpretation, and study supervision. All authors contributed to and have approved the final manuscript.

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APPENDIX A

Mean, standard deviation, skewness and kurtosis of the original SACQ items in Study 1 (n = 730)

	M	*SD*	Skewness	Kurtosis
sacq1	3.25	0.65	-0.51	0.25
sacq2	2.54	0.99	-0.10	-1.03
sacq3	2.76	0.76	-0.41	-0.01
sacq4	3.22	0.83	-0.83	-0.01
sacq5	3.62	0.67	-1.90	3.54
sacq6	2.51	0.79	-0.12	-0.41
sacq7	2.23	1.21	0.37	-1.44
sacq8	2.16	0.90	0.28	-0.78
sacq9	3.19	0.71	-0.64	0.41
sacq10	2.32	1.05	0.28	-1.13
sacq11	2.48	0.93	-0.03	-0.86
sacq12	2.43	1.03	0.04	-1.15
sacq13	2.73	0.72	-0.47	0.22
sacq14	1.57	0.82	1.21	0.39
sacq15	3.51	0.67	-1.37	1.84
sacq16	3.00	0.89	-0.59	-0.41
sacq17	2.51	0.96	-0.02	-0.95
sacq18	2.27	0.96	0.18	-0.96
sacq19	3.18	0.81	-0.67	-0.28
sacq20	2.29	1.15	0.28	-1.37
sacq21	2.25	1.11	0.34	-1.24
sacq22	2.29	1.30	0.28	-1.66
sacq23	3.79	0.50	-2.80	9.49
sacq24	3.14	0.94	-0.82	-0.32
sacq25	2.50	0.94	-0.06	-0.88
sacq26	1.56	0.94	1.45	0.77
sacq27	1.90	0.98	0.67	-0.77
sacq28	2.34	1.15	0.17	-1.41
sacq29	2.35	1.01	0.17	-1.07
sacq30	2.01	0.94	0.42	-0.97
sacq31	2.11	1.34	0.55	-1.54
sacq32	2.30	1.13	0.22	-1.34
sacq33	2.74	1.29	-0.39	-1.58
sacq34	2.33	1.20	0.21	-1.49
sacq35	2.30	1.16	0.25	-1.40
sacq36	2.62	0.87	-0.24	-0.58
sacq37	3.24	0.70	-0.75	0.67
sacq38	2.45	1.06	0.00	-1.22
sacq39	2.56	0.94	-0.05	-0.89
sacq40	2.34	1.17	0.20	-1.44
sacq41	2.36	1.03	0.17	-1.12
sacq42	2.16	1.23	0.45	-1.42
sacq43	2.86	0.81	-0.38	-0.30
sacq44	3.69	0.61	-2.05	4.02
sacq45	2.36	1.02	0.09	-1.13
sacq46	2.50	0.95	-0.11	-0.91
sacq47	3.67	0.66	-2.15	4.50
sacq48	2.15	1.22	0.47	-1.39
sacq49	2.57	1.09	-0.13	-1.26
sacq50	2.92	0.83	-0.61	0.03
sacq51	2.16	1.25	0.45	-1.47
sacq52	2.30	1.01	0.25	-1.03
sacq53	2.96	0.76	-0.41	-0.09
sacq54	2.89	0.82	-0.48	-0.17
sacq55	3.05	0.89	-0.61	-0.48
sacq56	2.14	1.27	0.48	-1.49
sacq57	2.27	1.21	0.31	-1.48
sacq58	2.27	1.15	0.31	-1.34
sacq59	2.24	1.28	0.34	-1.59
sacq60	2.14	1.35	0.51	-1.60
sacq61	2.14	1.34	0.50	-1.57
sacq62	2.98	0.81	-0.45	-0.32
sacq63	2.93	1.00	-0.59	-0.72
sacq64	2.41	0.92	0.02	-0.84
sacq65	3.11	0.80	-0.71	0.16
sacq66	3.03	0.71	-0.36	-0.07
sacq67	3.27	0.72	-0.69	0.02

APPENDIX B

The SACQ-SF items (SACQ items number and subscale)

Studying (S)

1. Non sto studiando così tanto come dovrei per seguire le lezioni e preparare le materie* (*item 17 Academic Adjustment*, "*I'm not working as hard as I should at my course work*")
2. Ultimamente non ho avuto molta motivazione a studiare* (*item 29 Academic Adjustment*, "*I'm not really smart enough for the academic work I am expected to be doing now*")
3. Mi sento soddisfatto del mio rendimento universitario (*item 13 Academic Adjustment, "I am satisfied with the level at which I am performing academically*")
4. Ultimamente non sono stato molto efficiente nella gestione del tempo da dedicare allo studio (*item 25 revised Academic Adjustment*, "*I have not been very efficient in the use of study time lately*")

Social adjustment (SA)

5. Ho diversi legami sociali significativi all'Università (*item 18 Social Adjustment*, "*I have several close social ties at college*")
6. Sento di poter socializzare con i colleghi (*item 37 revised Social Adjustment*, "*I feel that I have enough social skills to get along well in the college setting*")
7. All'Università ho alcuni colleghi fidati con cui posso parlare di qualunque tipo di problema (*item 63 Social Adjustment*, "*I am some good friends or acquaintances at college with whom I can talk about any problems I may have*")
8. Sono soddisfatto della mia vita sociale all'Università (*item 65 Social Adjustment*, "*I am quite satisfied with my social life at college*")

Satisfaction with curriculum (SAT)

9 Sono soddisfatto del numero e della varietà di corsi che si possono frequentare all'Università (*item 36 Academic Adjustment*, "*I am satisfied with the number and and variety of courses available at college*")
10 Sono soddisfatto della qualità e del calibro delle lezioni che si tengono (*item 43 Academic Adjustment*, "*I am satisfied with the number or the caliber of courses available at college*")
11 Sono soddisfatto dei programmi delle materie (*item 54 Academic Adjustment* "*I am satisfied with my program of courses for this semester*")
12 Sono soddisfatto dei professori che tengono le lezioni (i*tem 62 Academic Adjustment*,"*I am quite satisfied with the professors I have now in my courses*")

* Reverse item

APPENDIX C

Exploratory factor analysis of the SACQ-SF items and Cronbach's aplha in Study 3 (n = 211)

	S	SA	SAT	
Eigenvalues	1.96	1.40	4.33	
Cronbach's alpha	.76	.80	.83	
1 Non sto studiando così tanto come dovrei per seguire le lezioni e preparare le materie (r)	.85			
2 Ultimamente non ho avuto molta motivazione a studiare (r)	.46			
3 Mi sento soddisfatto del mio rendimento universitario	.58			
4 Ultimamente non sono stato molto efficiente nella gestione del tempo da dedicare allo studio	.64			
5 Ho diversi legami sociali significativi all'Università		.64		
6 Sento di poter socializzare con i colleghi		.66		
7 All'Università ho alcuni colleghi fidati con cui posso parlare di qualunque tipo di problema		.81		
8 Sono soddisfatto della mia vita sociale all'Università		.80		
9 Sono soddisfatto del numero e della varietà di corsi che si possono frequentare all'Università				.51
10 Sono soddisfatto della qualità e del calibro delle lezioni che si tengono				.81
11 Sono soddisfatto dei programmi delle materie				.76
12 Sono soddisfatto dei professori che tengono le lezioni				.69

Note. S Studying, SA Social adjustment, SAT Satisfaction with curriculum. Factor loadings lower than .40 are not reported

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