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Adapting to Life Contexts: Evaluating the Acquisition and Types of Life Skills

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Abstract

Life skills are essential to human functioning, particularly during the transition into adulthood. This study analyzed the validity of two related measures of life skills (Life Skills Acquisition Questionnaire—LSAQ; and Life Skills Questionnaire—LSQ), which may serve as useful tools for understanding which life skills are learned and how their acquisition progresses. A quantitative cross-sectional study was conducted with a final sample of 1148 high school students who completed LSAQ, LSQ, and a measure of academic achievement expectations (AAEs). Factorial structure, reliability, convergent, discriminant and predictive validity, as well as temporal stability was assessed for both measures. LSAQ results endorsed either a four-factor model or a second-order latent factor, both encompassing key stages of life skills development (i.e., motivation, learning, automatization, and transference). LSQ results supported validity for six life skills (motivation, time management, stress management, communication, teamwork, and leadership). Both instruments showed the predictive validity of AAEs and good temporal stability. Both measures can help practitioners and researchers evaluate whether opportunities such as intervention programs affect the acquisition and diversity of life skills that students gain. They are also useful for testing theoretical models of life skills and for providing insights into how these skills are developed.

Keywords: motivation; time management; stress management; communication; teamwork; leadership; learning skills; acquisition; skills transference; mental skills



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1. Introduction and State of the Art

Life skills are considered essential elements of human functioning, particularly during the transition to adulthood [1]. In general, there is a positive view of life skills as contributing to human development, leading to a successful and healthy life [2], particularly for adolescents [3]. Thus, it is not surprising that well-known organizations such as UNICEF [4] and the World Health Organization [5] emphasize that life skills can facilitate the possibility of individuals having a productive participation in society. In general, life skills are understood as “skills that enable individuals to succeed in the different environments

in which they live, such as school, home and in their neighbourhoods” [6] (p. 40). Even UNICEF [4] proposes that life skills should be broadly understood as adaptive and positive behaviors that enable individuals to deal effectively with the demands and challenges of everyday life [4]. Similarly, the WHO [5] indicated that life skills are composed of all skills that people must have to deal with the demands and challenges of their daily lives, which can augment the possibility of living healthy and productive lives. Although life skills are frequently discussed as a central and distinct construct, substantial overlap exists with the literature on socioemotional competencies and social–emotional learning. For example, competencies such as self-management, communication, interpersonal relationships, teamwork, leadership, and responsible decision-making are commonly represented in both frameworks. However, whereas socioemotional competency models primarily classify emotional, cognitive, and interpersonal capabilities, the life skills perspective has traditionally emphasized the practical application of these capabilities to successfully deal with everyday challenges and facilitate adaptation across different life contexts. Thus, life skills may be understood as the functional expression of socioemotional competencies in real-world situations, emphasizing processes of transference of life skills to facilitate human adaptation to life contexts [7].

There is an abundance of data showing that training life skills can be very effective in enhancing people’s psychosocial and even physical abilities, but data is quite biased for adolescents [8,9]. For example, Singla et al. [10] conducted a systematic review and meta-analysis to identify key implementation processes and effectiveness of life skills programs among adolescents and found out that interventions were effective and tended to focus on parent–child interactions ($\beta = 0.557$, $p < 0.05$), assessing interpersonal relations ($\beta = 0.204$, $p < 0.05$), and stress management ($\beta = 0.216$, $p < 0.05$). In other words, interventions with adolescents seem to focus on personal life skills (i.e., stress management skills), relationships with others, notably peers (interpersonal skills), and relationships with adults, namely parents (communication skills).

For adults, there are fewer indications about the relevance of life skills to human development. For example, Tanious et al. [11], in a scoping review of life skills development and transfer in emerging adults, concluded that (a) the majority of studies did not provide a clear definition of the term life skills; (b) only one study mentioned the concept of life skills transfer in terms of its components; and (c) research focuses mainly on vulnerable populations (e.g., developmental and contextual vulnerabilities and sexually transmissible infection treatment and prevention) and particularly relevant life skills related to budgeting/finances, communication, problem-solving, decision-making, and emotional regulation. Nevertheless, existing data suggests that life skills training in adults is also effective and valuable, improving aspects related to decision making, problem solving, communication, interpersonal relationships, coping with emotions, coping with stress, creative thinking, and critical thinking [12]. In sum, the existing knowledge provides evidence that it is important to augment our understanding of how life skills spread across the lifespan, and challenges researchers and practitioners to focus beyond the first stages of human life.

Another important topic of discussion is how life skills are learned and used by people in their lives. In general terms, it is admitted that people can learn life skills in two ways. The implicit way assumes that people learn life skills as long as they are exposed to meaningful learning opportunities throughout their lives that allow them to acquire life skills that can eventually transfer to distinct life contexts; on the other hand, the explicit way assumes that people can learn life skills if they are formally taught by experts that provide the adequate learning opportunities that help participants learn and then transfer the life skills [13,14]. Although some authors advocate one perspective over another, others

acknowledge that both can contribute to life skills learning and that they can occur along a continuum [15]. For example, Gomes and Resende [7] identify life skills as “human potentialities that can be stimulated through systematic training (i.e., explicit way) or that can be developed from people’s everyday experiences (i.e., implicit way), allowing human adaptation to changing events” (p. 204). Regardless of how people learn life skills, it is quite interesting that the concept of transfer is inherent to the concept of life skills itself. For example, Morowatisharifabad et al. [16] define life skills as “strategies that enable people to live a successful life in different environments” (p. 9623, emphasis added). Similarly, Camiré [13] asserts that “life skills refer to a person’s ability to do life well through the successful completion of everyday tasks and a meaningful engagement at school, at work, at home and in the community” (p. 1, emphasis added). In the case of sports, Gould and Carson [3] defined life skills as “internal personal assets, characteristics, and skills, such as goal setting, emotional control, self-esteem, and hard work ethic that can be facilitated or developed in sport and are transferred for use in non-sport settings” (p. 60, emphasis added). Thus, the concept of life skills transfer refers to the “application of life skills in settings other than the one(s) where they were originally acquired” [11] (p. 2). Despite the inherent importance of transfer in life skills, it is quite interesting that we are far from knowing how life skills are learned along the stages of human life (implicitly, explicitly, or even along a continuum?) and if and how they are transferred across distinct human life contexts. For example, Holt et al. [17], in a meta-analysis of positive youth development through sports studies, found little information about how explicit pedagogical strategies were used to promote transfer, noting other examples where transfer could occur implicitly, without deliberate attempts.

Considering the inherent value of life skills to human functioning and adaptation and some limitations of current literature (i.e., which life skills are relevant and required to human adaptation to life contexts and how individuals learn life skills throughout their lives), this study contributes to literature in two ways.

First, it proposes two measures to evaluate life skills, with one directed at specific life skills that individuals can use in their lives (Life Skills Questionnaire, LSQ) and another one directed at the stages implicated in the learning process of life skills (Life Skills Acquisition Questionnaire, LSAQ). Both measures were developed based on the Life Skills Efficacy Model [7], where it is proposed that life skills can be described in terms of typology (e.g., cognitive, intellectual, emotional, motor, and physical) and functionality (e.g., from interpersonal to personal life skills) as well as that people can acquire life skills more efficiently if they have the opportunity to progress along four stages (e.g., motivation, learning, automatization, and transference).

The LSQ was developed to evaluate six representative life skills covering self-regulatory cognitive functioning (motivation and time management), emotional regulation (stress management), and interpersonal functioning (communication, teamwork, and leadership). These dimensions were selected because they represent core adaptive competencies repeatedly identified across major life skills frameworks and empirical research [4,5,10]. These abilities have been recognized as important components of human development, as is the case in the WHO [18], UNICEF [4], and subsequent meta-analytic studies [11]. In fact, organizing the life skills into cognitive, personal, and interpersonal skills is in accordance with the proposal of UNICEF, which seems to be one of the most prevalent in the literature when it comes to explaining what types of life skills people use [11]. Also important is the fact that the LSQ measures similar dimensions to existing questionnaires, as is the case of the Youth Experience Survey—Sports (YES-S) [19]), which is an adaptation of the Youth Experience Survey 2.0 (YES-2.0) [20]), as well as subsequent derived measures such as the adaptation to sports (e.g., the Life Skills Scale for Sport, LSSS) [21]) and the adaptation

for higher education students, as is the case of the Life Skills Ability Scale (LSAS) [22]). Although in this study the LSQ is adapted from a population of youths to one of adults, it is not directed originally at one specific population, as is the case of the LSSS and the Yes-S, which were developed for young athletes, and even the YES-2.0, which was developed for youths. Nevertheless, some measures of life skills directed at adults do exist. For example, Kamble and Kumar [23] proposed the LS-ABC scale intended to evaluate the ten core life skills as given by the WHO; the authors started by developing a measure of almost 100 items capturing all ten core life skills, but ended with a measure of 19 items evaluating only three major constructs related to affective, behavioral, and cognitive skills. Even though each of these three constructs includes items from the ten core life skills, the final solution of three factors somewhat loses the specificity which is needed to better comprehend the most significant life skills that can be used by adults. Also, other existent proposals do not measure exactly the same constructs of the LSQ, as is the case of the Life Skills Scale (LSS) [2]), directed to evaluate the agency and structure of life skills and the Life Skills Scale—Short (LSS-S) [24], which proposes to measure life skills related to participation, realistic attunement, and perspective taking (LSS-S).

Although there is considerable diversity regarding the classification of life skills, several theoretical perspectives suggest that life skills can be organized according to both their psychological nature and their functional role in adaptation. Previous work has classified life skills as cognitive, emotional, social, interpersonal, and intrapersonal competencies that facilitate effective functioning across distinct life domains. According to the Life Skills Efficacy Model [7], life skills represent adaptive resources that help individuals regulate their thoughts, emotions, and actions while interacting effectively with others and coping with everyday life demands. Therefore, life skills are not defined by a specific context of application, but by their contribution in helping individuals achieve successful adaptation across multiple life domains. Following the Life Skills Efficacy Model, six life skills were selected to represent different levels of human functioning. Specifically, motivation and time management were included because they evaluate self-regulatory cognitive skills related to ones' ability to set personal goals, as well as the ability to organize, plan, and persist in their time management skills. Stress management was included because it evaluates ones' ability to regulate emotional responses which represents a key component of adaptive functioning and psychological well-being. Communication, teamwork, and leadership were selected because they evaluate interpersonal life skills that facilitate successful interaction with others, collaborative work, and positive social influence. These dimensions have been reinforced by international life skills frameworks and empirical studies showing that intrapersonal abilities (such as motivation, time management, and stress management) and interpersonal abilities (such as communication, leadership, and teamwork) consistently emerge among the most frequently identified life skills across educational, community, health, and sport settings [4,5,25]. These competencies have also been associated with positive developmental outcomes, including academic achievement, psychosocial adjustment, well-being, employability, and positive youth development [8–10].

Regarding the Life Skills Acquisition Questionnaire (LSAQ), to the best of our knowledge, it represents a pioneer measure of life skills stages, including motivation, learning, automatization, and transfer [7], although some measures exist that evaluate the transfer phase in sports contexts [26,27]. The emphasis on the transfer phase is because it is critical to evaluate whether life skills are effectively learned and applied by individuals throughout their life contexts. In fact, several authors claim that without knowing if life skill transfer occurs, it cannot be assumed that there is any appropriation by the individual of the skill at all [13,14]. Nevertheless, the LSAQ advances current knowledge by offering a broad perspective of the stages involved in the learning process of life skills, thus evidencing that

the stages of motivation, learning, and automatization (in conjunction with transfer) are all important for comprehending the complexity of using a life skill [7]. Specifically, there is evidence that being interested (i.e., motivated) in life skills and having the opportunity to know about, and reflect on, the topic of life skills (i.e., learning) are important factors involved in their development [3,14,28]. In this sense, and using the sports contexts as background, some authors advocate the need to provide structured debriefing exercises (i.e., learning opportunities) to help athletes to improve their life skills [29,30]. Also, the possibility of automatizing the life skills is also viewed as important because research suggests that life skills can be learned “automatically”, without minimal control and awareness (i.e., implicitly) [31], thus making them important to monitor (i.e., evaluate). Once again, the Life Skills Efficacy Model [7] was used to develop the LSAQ because it is proposed in the model that life skills are better acquired for individuals when they have the chance to go through four stages of learning (e.g., motivation, learning, automatization, and transference).

Second, the measures proposed in this study can contribute to theoretical understanding of what skills people learn and how they progress in this learning process. In fact, meta-analytic studies have been concluding that a major topic to improve in the literature is the development and use of specific conceptual frameworks that can explain how life skills develop and transfer across the life cycle and life contexts [11].

Considering all these aspects, this study has the main goal of testing two interrelated measures of life skills, and also collecting one measure of academic achievement, because there is evidence that life skills can increase the perception of academic performance of students [32,33], who represent the sample used in this study. The use of the academic achievement measure served as an indicator of criterion-related validity because previous literature suggests that life skills are positively associated with academic adaptation and educational functioning [34]. However, it is important to note that this measure assesses students’ expectations regarding their future academic success, rather than objective academic achievement. Therefore, it was used as an external criterion theoretically expected to be associated with life skills, providing an initial examination of predictive validity within an educational context.

2. Method

2.1. Scales Development

The same procedure was followed for the development of LSAQ and LSQ instruments. Both instruments were based on the Life Skills Efficacy Model [7], thus respecting the stages of life skills acquisition for the LSAQ instrument, and the personal and the interpersonal functionality of life skills for the LSQ instrument. Specifically, the LSAQ had to include items to evaluate the four stages of life skills acquisition: motivation, learning, automatization, and transfer. The LSQ had to include items that reflect distinct typologies (e.g., cognitive, intellectual, and emotional) and functionalities (e.g., personal and interpersonal areas) of life skills.

The team responsible for item generation included six PhD researchers (five from psychology and one from sports science) and two masters in psychology (MPsych) researchers. All PhD researchers had a minimum of five years of experience; one of the MPsych researchers had one year of experience and the other had 15 years of working experience with adolescents in topics related to human development. The first stage involved generating items for both instruments (one team was involved in this task) and the second stage involved selecting final items for each instrument (another team was involved in this task). The final goal was to develop two final versions of the instruments with an equilibrium of items per factor, preferably not exceeding four, as advised by Bollen [35].

There were two criteria followed by the first team in stage one: (1) generating items with language clarity that corresponded to the original theoretical factors, and (2) providing a final version with six items per factor then be reduced in the second stage. The first task was done independently by each member (four PhD researchers assumed this task, two for each instrument). The second task involved a team meeting to discuss the items' generation, following this procedure: teams first analyzed the proposed items (teams switched tasks, analyzing the instrument of the other team), and then analyzed again the items in the presence of the four researchers.

There were three criteria followed by the second team in stage two: (1) analyzing the language clarity (items' wording and sentences), (2) analyzing the theoretical conformity (how appropriate each item was for measuring the original factor), and (3) providing two instruments with four items per factor. The first task was done in small groups to discuss opinions, with a final group debate to make the final selection of items. The final result of the item generation proposed two versions with four items per factor: 16 items for LSAQ and 24 items for LSQ. After this stage, data was collected to allow for the testing of the psychometric properties of the instruments.

2.2. Data Collection Procedure

A quantitative cross-sectional design was used for the initial validation of the scales developed in a sample of students, in order to evaluate LSAQ and LSQ's factorial structure, reliability, and validity. Participants were recruited using a convenience sample, based on the professional contacts of the research team. Eligible participants were students in their high school years (from 10th to 12th grade), fluent in the Portuguese language, and whose parents gave consent. Data was collected during the semester, ensuring students were not in their evaluation period. The study was approved by the Ethics Committee of the University of the first author of this paper [University of Minho, CEICSH 128/2020].

Parental consent was obtained before data collection. Once underaged participants were authorized to participate, data was collected. Data collection was done by using an electronic platform that included the evaluation protocol, and the process was monitored by one member of our research team. Specifically, a QR Code was displayed to the students and those who were eligible and willing to participate scanned the code and completed an online questionnaire, including some demographic measures, the LSAQ, LSQ, and a measure of academic achievement expectations. The order of the instruments was randomized to avoid order effects. All main analyses were conducted with this high school sample.

2.3. Participants

The first step consisted of screening the data. No missing data was found. Data quality was assessed using multiple indicators of careless responding, including multivariate outlier detection and response time. A small number of cases were identified as potentially careless responders ($n = 65$), representing 5% of the sample. A final sample of 1148 participants was considered. Students were from six different schools, from both the public (50%) and private (50%) education systems. Participants were high school students, aged ranging from 14 to 27 ($M = 15.87$, $SD = 1.03$). Approximately half of the sample was female (50%; 49% male), and 1% preferred not to disclose their gender. Most students were in the 10th grade (55%), followed by the 11th (30%) and 12th grade (15%). Their main areas of study were undifferentiated (professional high school, 63%), Sciences and Technologies (23%), Social and Economic Sciences (11%), and Visual Arts (3%).

2.4. Measures

The Life Skills Acquisition Questionnaire (LSAQ; cf. Appendix A) evaluates four stages of life acquisition: motivation (e.g., “I am interested in learning more about life skills”), learning (e.g., “I know which life skills are most important for me personally”), automatization (e.g., “I try to master life skills before using them in my daily life”), and transference (e.g., “When I learn how to use a life skill in my daily life, I try to apply it in other areas of my life”). The instrument includes 16 items (four per dimension), answered on a 5-point Likert scale (1 = Never; 5 = Always). Higher values correspond to a higher perception of acquiring life skills along the proposed stages.

The Life Skills Questionnaire (LSQ; cf. Appendix B) evaluates six life skills: motivation (e.g., “I know which goals I want to achieve”), time management (e.g., “I can organize my schedule according to the activities I need to complete”), stress management (e.g., “I can deal well with situations that might make me nervous”), communication (e.g., “I can speak calmly even when I disagree with someone”), teamwork (e.g., “When working in a group or team, I help my colleagues to define each person’s roles and responsibilities”), and leadership (e.g., “When I am in charge (“leader”) of a team or group, I explain to everyone involved what each person should do”). The instrument includes 24 items (four per dimension), answered on a 5-point Likert scale (1 = Never; 5 = Always). Higher values correspond to a higher perception of using life skills.

Finally, Academic Achievement Expectations (AAEs) [36]) evaluates students’ perceptions of their academic achievement (e.g., “I will successfully complete the academic year”) and includes 5 items answered on a 5-point Likert scale (1 = Certainly not; 5 = Certainly yes). Higher values correspond to a higher perception of using academic achievement expectations (α for this study = 0.83).

2.5. Data Analysis Strategy

The data analyses procedure followed a seven-step process. First, a preliminary analysis on the data, checking normality and multicollinearity assumptions, as well as the identification of missing data and outliers was performed. Second, the total sample was split into two groups: one for calibration (used to test the structure of the instruments and initial item calibration) and the other for validation (to validate the final versions of the instruments and to assess the model’s replicability). Then, the third step was conducted only with the calibration sample, which consisted of an Exploratory Factor Analysis on the original versions of the instruments to assess construct validity. All these steps were conducted on the IBM SPSS (version 31.0). These analyses were followed by a Confirmatory-Factor analysis to test for reliability, and convergent and discriminant validity (fourth step), using the IBM AMOS SPSS (30.0). The fifth step was conducted using the validation sample to conduct cross-validation analysis. Therefore, a new CFA was conducted on this sample, and reliability, and convergent and discriminant validity were assessed. The sixth step consisted of the predictive validity analysis of the final version of the instruments. The seventh and final step referred to temporal stability through test–retest.

3. Results

3.1. Step 1: Preliminary Analysis

Skewness and kurtosis were assessed to check for normality assumptions, following Kline’s [37] criteria ($\leq |3|$ and $\leq |10|$, respectively). Thus, no violations of normal distribution were observed ($-1.04 > sk < 0.01$; $-1.14 > ku < 0.93$). Similarly, the non-multicollinearity assumption was also met, as all VIF coefficients were below five [38].

3.2. Step 2: Split the Sample into Two Subsamples

Participants were randomly assigned to either the calibration sample (corresponding to 60% of cases, $n = 698$) or to the validation sample (corresponding to 40% of cases, $n = 450$) [39]. The two samples were similar in terms of gender [$\chi^2 (2) = 0.39, p = 0.821$], school [$\chi^2 (6) = 11.68, p = 0.069$], course [$\chi^2 (5) = 8.98, p = 0.110$], and previously held back [$\chi^2 (1) = 0.08, p = 0.774$]. Both samples were also homogeneous in terms of participants' ages [$t (1145) = 1.62, p = 0.105$].

3.3. Step 3: Exploratory Factor Analysis (Calibration Sample)

Exploratory Factor Analysis (EFA) tested the construct validity of the instruments, checking the theoretical dimensionality of the instruments. The factor structure was conducted using Principal Axis Factor with a Direct Oblique Rotation (Oblimin). The analysis considered the Kaiser–Meyer–Olkin (KMO) and Bartlett's indices; also, eigenvalues analysis considered the Kaiser Criterion (>1). The sample adequacy measure of each item was done using an anti-image matrix ($MAS > 0.83$). The solutions obtained in the analysis were compared against the expected theoretical factors determined for each instrument. When a mismatch was found, a theory-constrained EFA (forcing the number of extracted factors) was conducted. In those cases, the final decision was based on the conceptual development and on which distribution represented the best factor and construct coherence and meaning, balanced with the psychometric indicators. The criteria for retention of items in the exploratory model were factor loadings above 0.4; no or few cross-loading items; accepting the structure if it explained at least 50% of total variance; and at least three items per factor [40]. Internal consistency was calculated by using the Cronbach's alpha.

Life Skills Acquisition Questionnaire (LSAQ). Results from the unconstrained EFA showed a solution of three factors (explained variance = 56%). Inspection of the factor pattern indicated that motivation, learning, and automatization emerged as relatively distinct dimensions, whereas the transference items did not form an independent factor, and instead showed cross-loadings primarily with the learning and automatization dimensions. Given that the unconstrained solution did not fully reproduce the Life Skills Efficacy Model [7], a theory-constrained four-factor solution was subsequently examined. The four-factor solution was retained because it successfully differentiated the theoretically expected dimensions of motivation, learning, automatization, and transference, while demonstrating satisfactory psychometric indicators (KMO = 0.936; Bartlett's Test = 5676.17, $df = 120, p < 0.001$; explained variance = 67%). Communalities varied from 0.55 to 0.78, which was very acceptable. All items exceeded a factor loading of 0.50, indicating they were good representations of their respective dimension (cf. Table 1).

Life Skills Questionnaire (LSQ). The six-dimension structure showed better factor loadings and alignment with the theoretical framework compared to the unconstrained EFA and, therefore, was kept as the initial structure for the instrument (KMO = 0.917; Bartlett's Test = 7265.65, $df = 276, p < 0.001$), explaining 64% of variance. Communalities varied from 0.47 to 0.74, which was very acceptable. Regarding item loading, all items loaded higher than 0.40 on one factor, indicating good representations of their respective dimensions (cf. Table 2). However, some items loaded on more than one factor or in a different factor from the one expected (items 3, 4, 13), suggesting that their removal might be appropriate in the following steps. Alpha values were acceptable for motivation ($\alpha = 0.74$), time management ($\alpha = 0.74$), stress management ($\alpha = 0.86$), communication ($\alpha = 0.69$), teamwork ($\alpha = 0.83$), and leadership ($\alpha = 0.85$).

Table 1. LSAQ EFA Results: Factor Loadings and Explained Variance (%).

Item	1 (8%)	2 (7%)	3 (47%)	4 (5%)
MOT 1	0.731			
MOT 2	0.836			
MOT 3	0.754			
MOT 4	0.604			
LEA 5		−0.728		
LEA 6		−0.868		
LEA 7		−0.814		
LEA 8		−0.561		
AUT 9			0.819	
AUT 10			0.576	
AUT 11			0.863	
AUT 12			0.862	
TRN 13				0.786
TRN2 14				0.520
TRN 15				0.764
TRN 16				0.596

Note: factor loadings below 0.30 were suppressed. MOT = motivation; LEA = learning; AUT = automatization; TRN = transference.

Table 2. LSQ EFA results: factor loadings and explained variance (%).

Item	1 (4%)	2 (6%)	3 (12%)	4 (5%)	5 (4%)	6 (33%)
MOT1	0.753					
MOT2	0.728					
MOT3	0.470		0.363			
MOT4	0.334		0.515			
Time 5		0.804				
Time 6		0.823				
Time 7		0.643				
Time 8		0.553			−0.350	
STR 9			0.833			
STR 10			0.796			
STR 11			0.853			
STR 12			0.719			
COM 13				0.385	−0.429	
COM 14				0.628		
COM 15				0.801		
COM 16				0.741		
TW 17					−0.646	
TW 18					−0.735	
TW 19					−0.649	
TW 20					−0.456	0.351
LEAD 21						0.663
LEAD 22						0.713
LEAD 23						0.798
LEAD 24						0.735

Note: factor loadings below 0.30 were suppressed. MOT = motivation; Time = time management; STR = stress management; COM = communication; TW = teamwork; LEAD = leadership.

3.4. Scale Refinement (Calibration Sample)

Structural Equation Modeling (SEM) was performed to test the factor structure of both instruments in the calibration sample, using maximum likelihood (ML) estimation methods. The quality of the model fit to the data was assessed based on a combination of indices: (1) the chi-square goodness-of-fit statistics (χ^2) and the absolute index (χ^2/df); (2) the comparative fit index ($CFI \geq 0.90$) and the Tucker–Lewis index ($TLI \geq 0.90$); (3) the root mean square error of approximation ($RMSEA \leq 0.08$) and the standardized root mean square residual ($SRMR \leq 0.08$); and (4) the Akaike Information Criterion (AIC) [37,41]. Internal consistency was calculated by using the composite reliability measure ($CR \geq 0.70$) [38,42].

For the reliability of the individual items, two indicators were assessed: regression weights ($\lambda \geq 0.50$) and explained variance ($R^2 \geq 0.25$). To evaluate the instruments' convergent and discriminant validity, Fornell and Larcker's [43] recommendations were considered. Specifically, convergent validity was analyzed based on the average variance extracted and on the composite reliability ($AVE \geq 0.50$ and $AVE < CR$). Discriminant validity was supported when the maximum shared squared variance (MSV) was lower than the AVE values of two subscales [42]. Tables 3–5 summarize the results for both scales.

Life Skills Acquisition Questionnaire (LSAQ). Results showed that the four-factor structure was a good fit for the data: $\chi^2(96) = 333.20$; $\chi^2/df = 3.47$, $p < 0.001$; CFI = 0.958; TLI = 0.947; RMSEA = 0.060, $p = 0.012$, 90% CI [0.053, 0.067]; SRMR = 0.036; AIC = 413.20. Item loadings were good ($\lambda \geq 0.65$) and R^2 per dimension varied from 0.27 to 0.40. However, when looking at the validity coefficients, the motivation phase has low convergent validity (even though close to the acceptable value; $AVE = 0.46$), and all dimensions failed discriminant validity, since MSV is higher than AVE in every subscale. These results may suggest that participants are not able to differentiate the different stages of life skills acquisition. Therefore, a second-order factor was tested, showing a good fit for the data: $\chi^2(100) = 418.48$; $\chi^2/df = 4.19$, $p < 0.001$; CFI = 0.943; TLI = 0.932; RMSEA = 0.068, $p < 0.001$, 90% CI [0.061, 0.074]; SRMR = 0.043; AIC = 490.48. When comparing both solutions, the four-factor presents a significantly better fit than the single factor option, $\Delta \chi^2(4) = 85.28$, $p < 0.001$.

Table 3. Subscales, items, and factor weight loads for LSAQ and LSQ.

Instrument	Items
LSAQ (16 items)	
Motivation (4 items)	1 ($\lambda = 0.649$), 2 ($\lambda = 0.661$), 3 ($\lambda = 0.679$), 4 ($\lambda = 0.719$)
Learning (4 items)	5 ($\lambda = 0.679$), 6 ($\lambda = 0.720$), 7 ($\lambda = 0.778$), 8 ($\lambda = 0.754$)
Automatization (4 items)	9 ($\lambda = 0.712$), 10 ($\lambda = 0.761$), 11 ($\lambda = 0.814$), 12 ($\lambda = 0.841$)
Transference (4 items)	13 ($\lambda = 0.732$), 14 ($\lambda = 0.729$), 15 ($\lambda = 0.741$), 16 ($\lambda = 0.699$)
LSQ (24-item version)	
Motivation (4 items)	1 ($\lambda = 0.607$), 2 ($\lambda = 0.593$), 3 ($\lambda = 0.657$), 4 ($\lambda = 0.701$)
Time management (4 items)	5 ($\lambda = 0.544$), 6 ($\lambda = 0.773$), 7 ($\lambda = 0.714$), 8 ($\lambda = 0.631$)
Stress management (4 items)	9 ($\lambda = 0.767$), 10 ($\lambda = 0.827$), 11 ($\lambda = 0.775$), 12 ($\lambda = 0.720$)
Communication (4 items)	13 ($\lambda = 0.461$), 14 ($\lambda = 0.668$), 15 ($\lambda = 0.645$), 16 ($\lambda = 0.654$)
Teamwork (4 items)	17 ($\lambda = 0.733$), 18 ($\lambda = 0.816$), 19 ($\lambda = 0.815$), 20 ($\lambda = 0.634$)
Leadership (4 items)	21 ($\lambda = 0.791$), 22 ($\lambda = 0.822$), 23 ($\lambda = 0.746$), 24 ($\lambda = 0.718$)
LSQ (18-item version)	
Motivation (3 items)	1 ($\lambda = 0.566$), 2 ($\lambda = 0.544$), 4 ($\lambda = 0.680$)
Time management (3 items)	6 ($\lambda = 0.705$), 7 ($\lambda = 0.750$), 8 ($\lambda = 0.658$)
Stress management (3 items)	9 ($\lambda = 0.809$), 10 ($\lambda = 0.811$), 11 ($\lambda = 0.761$)
Communication (3 items)	14 ($\lambda = 0.663$), 15 ($\lambda = 0.661$), 16 ($\lambda = 0.665$)
Teamwork (3 items)	17 ($\lambda = 0.730$), 18 ($\lambda = 0.836$), 19 ($\lambda = 0.823$)
Leadership (3 items)	21 ($\lambda = 0.794$), 22 ($\lambda = 0.827$), 23 ($\lambda = 0.736$)

Life Skills Questionnaire (LSQ). The CFA results yielded an adequate fit of the six-factor scale to the data: $\chi^2(237) = 744.86$; $\chi^2/df = 3.14$, $p < 0.001$; CFI = 0.928; TLI = 0.916; RMSEA = 0.055, $p = 0.023$, 90% CI [0.051, 0.060]; SRMR = 0.056; AIC = 870.89. However, item 13 presented a factor loading < 0.50 , suggesting its removal from the instrument. Considering this and the issues on convergent and discriminant validity of the 24-item version, the items with lower factor loading in each dimension were removed (i.e., items 3, 5, 12, 13, 20, 24). The 18-item version showed a significantly better fit to the data than the 24-item version: $\Delta \chi^2(118) = 409.40$, $p < 0.001$; $\chi^2(119) = 335.46$; $\chi^2/df = 2.82$, $p < 0.001$; CFI = 0.958; TLI = 0.946; RMSEA = 0.051, $p = 0.380$, 90% CI [0.045, 0.058]; SRMR = 0.050; AIC = 439.46. The subsequent analyses showed that motivation had a composite reliability below the cut-off value (0.67), and also had issues regarding convergent and discriminant validity.

Communication had an AVE < 0.50, which means low convergent validity, even though it is above 0.40 and, therefore, can be accepted considering the remaining indicators [44].

Table 4. Reliability, convergent, and discriminant validity for LSAQ and LSQ.

	<i>Alpha</i>	CR	MaxR(H)	AVE	MSV	SR_AVE
LSAQ						
Motivation	0.784	0.772	0.891	0.459	0.619	0.678
Learning	0.836	0.823	0.827	0.538	0.661	0.734
Automatization	0.861	0.864	0.951	0.614	0.637	0.784
Transference	0.814	0.816	0.927	0.526	0.661	0.725
LSQ (24-item version)						
Motivation	0.735	0.688	0.694	0.425	0.558	0.652
Time management	0.742	0.763	0.964	0.450	0.472	0.671
Stress management	0.855	0.856	0.858	0.598	0.558	0.773
Communication	0.692	0.702	0.943	0.376	0.327	0.613
Teamwork	0.829	0.839	0.890	0.567	0.323	0.753
Leadership	0.853	0.853	0.934	0.593	0.372	0.770
LSQ (18-item version)						
Motivation	0.677	0.673	0.674	0.407	0.491	0.638
Time management	0.744	0.748	0.959	0.498	0.483	0.705
Stress management	0.836	0.836	0.953	0.630	0.491	0.794
Communication	0.702	0.702	0.938	0.440	0.356	0.663
Teamwork	0.837	0.840	0.884	0.636	0.591	0.798
Leadership	0.828	0.829	0.927	0.619	0.591	0.787

Note. Alpha, Cronbach's alpha; AVE = Average Variance Extracted; CR = Composite Reliability; MaxR (H) = Maximum Reliability; MSV = Maximum Shared Squared Variance; SR_AVE = Square root of AVE.

Table 5. Inter-Construct Correlation LSAQ and LSQ.

LSAQ	1. MOT	2. LEA	3. AUT	4. TRN		
1. Motivation	1					
2. Learning	0.787 ***	1				
3. Automatization	0.692 ***	0.716 ***	0.1			
4. Transference	0.762 ***	0.798 ***	0.813 ***	1		
LSQ: 24-item Version	1. MT	2. TM	3. SM	4. CO	5. TW	6. LE
1. Motivation	1					
2. Time management	0.687 ***	1				
3. Stress management	0.747 ***	0.471 ***	1			
4. Communication	0.572 ***	0.485 ***	0.521 ***	1		
5. Teamwork	0.459 ***	0.449 ***	0.218 ***	0.568 ***	1	
6. Leadership	0.610 ***	0.466 ***	0.334 ***	0.559 ***	0.794 ***	1
LSQ: 18-item Version	1. MT	2. TM	3. SM	4. CO	5. TW	6. LE
1. Motivation	1					
2. Time management	0.725 ***	1				
3. Stress management	0.784 ***	0.487 ***	1			
4. Communication	0.617 ***	0.488 ***	0.515 ***	1		
5. Teamwork	0.454 ***	0.459 ***	0.181 **	0.513 ***	1	
6. Leadership	0.652 ***	0.478 ***	0.330 ***	0.534 ***	0.769 ***	1

Note. *** $p < 0.001$, ** $p < 0.010$.

3.5. Cross-Validation Analysis (Validation Sample)

To cross-validate the structure of the LSAQ and LSQ, new CFAs were conducted for each instrument, and the psychometric properties in terms of construct validity and reliability were analyzed again but now using the validation sample ($n = 450$). Results are summarized in Tables 6–8.

Table 6. Reliability, convergent, and discriminant validity for LSAQ and LSQ (validation).

	<i>Alpha</i>	CR	MaxR (H)	AVE	MSV	SR_AVE
LSAQ						
Motivation	0.824	0.814	0.910	0.523	0.672	0.723
Learning	0.854	0.846	0.851	0.579	0.731	0.734
Automatization	0.891	0.864	0.951	0.614	0.637	0.784
Transference	0.870	0.816	0.927	0.526	0.661	0.725
LSQ (18-item version)						
Motivation	0.662	0.651	0.662	0.385	0.621	0.621
Time management	0.754	0.764	0.963	0.521	0.621	0.722
Stress management	0.827	0.826	0.958	0.613	0.599	0.783
Communication	0.746	0.751	0.947	0.503	0.434	0.709
Teamwork	0.872	0.875	0.906	0.700	0.584	0.837
Leadership	0.833	0.834	0.937	0.627	0.584	0.792

Note. Alpha, Cronbach's alpha; AVE = Average Variance Extracted; CR = Composite Reliability; MaxR (H) = Maximum Reliability; MSV = Maximum Shared Squared Variance; SR_AVE = Square root of AVE.

Table 7. Subscales, items, and factor weight loads for LSAQ and LSQ (validation).

Instrument	Items
LSAQ (16 items; 2nd order)	
Motivation (4 items)	LSAQ ($\lambda = 0.894$)
Learning (4 items)	LSAQ ($\lambda = 0.903$)
Automatization (4 items)	LSAQ ($\lambda = 0.866$)
Transference (4 items)	LSAQ ($\lambda = 0.902$)
LSQ (18-item version)	
Motivation (3 items)	1 ($\lambda = 0.585$), 2 ($\lambda = 0.569$), 4 ($\lambda = 0.700$)
Time management (3 items)	6 ($\lambda = 0.724$), 7 ($\lambda = 0.795$), 8 ($\lambda = 0.638$)
Stress management (3 items)	9 ($\lambda = 0.795$), 10 ($\lambda = 0.803$), 11 ($\lambda = 0.750$)
Communication (3 items)	14 ($\lambda = 0.631$), 15 ($\lambda = 0.760$), 16 ($\lambda = 0.731$)
Teamwork (3 items)	17 ($\lambda = 0.775$), 18 ($\lambda = 0.887$), 19 ($\lambda = 0.845$)
Leadership (3 items)	21 ($\lambda = 0.821$), 22 ($\lambda = 0.800$), 23 ($\lambda = 0.753$)

Table 8. Inter-construct correlation for LSQ (validation).

LSQ: 18-Item Version	1. MT	2. TM	3. SM	4. CO	5. TW	6. LE
1. Motivation	1					
2. Time management	0.788 ***	1				
3. Stress management	0.774 ***	0.434 ***	1			
4. Communication	0.659 ***	0.457 ***	0.448 ***	1		
5. Teamwork	0.464 ***	0.487 ***	0.183 **	0.523 ***	1	
6. Leadership	0.605 ***	0.566 ***	0.300 ***	0.482 ***	0.764 ***	1

Note. *** $p < 0.001$, ** $p < 0.010$.

Life Skills Acquisition Questionnaire (LSAQ). Results confirmed that the four-structure model is a good fit for the data: $\chi^2(96) = 244.90$; $\chi^2/df = 2.55$, $p < 0.001$; CFI = 0.965; TLI = 0.959; RMSEA = 0.059, $p = 0.055$, 90% CI [0.050, 0.068]; SRMR = 0.033; AIC = 324.90. All dimensions presented good internal reliability, as well as convergent validity. Motivation, learning, and transference showed low discriminant validity, suggesting that a second-order factor might be a better solution. Indeed, a chi-square difference test showed that the second-order factor significantly increases model fit: $\Delta \chi^2(1) = 53.05$, $p < 0.001$; $\chi^2(95) = 191.85$; $\chi^2/df = 2.02$, $p < 0.001$; CFI = 0.979; TLI = 0.973; RMSEA = 0.048, $p = 0.642$, 90% CI [0.038, 0.057]; SRMR = 0.032; AIC = 273.85.

Life Skills Questionnaire (LSQ). The CFA showed that the six-factor structure is an excellent fit for the data: $\chi^2(119) = 230.61$; $\chi^2/df = 1.94$, $p < 0.001$; CFI = 0.969; TLI = 0.960;

RMSEA = 0.046, $p = 0.782$, 90% CI [0.037, 0.054]; SRMR = 0.048; AIC = 333.61. When inspecting the other validity indices, the motivation skill presented weaker psychometric performance than the remaining dimensions. Specifically, composite reliability fell below the conventional 0.70 threshold ($CR = 0.651$), while convergent and discriminant validity ($MSV > AVE$) indices also suggested potential concerns. These results do not necessarily justify excluding the dimension, but indicate a need for careful interpretation, and may require further refinement in future applications. Time management also showed some concerns in terms of discriminant validity ($MSV > AVE$), which did not occur with the calibration sample. The remaining factors showed good psychometric properties.

3.6. Step 6: Predictive Validity (Full Sample)

The academic domain was selected as a relevant context in which life skills may be expressed and transferred. Therefore, predictive validity analyses examined whether life skills were associated with students' expectations regarding future academic success. Once the factorial structure of the LSAQ and LSQ was stabilized, predictive validity was assessed using the total sample of the study ($n = 1148$). Regression analysis (cf. Table 9) was conducted for both instruments on academic achievement expectations (AAEs), controlling age and gender. Higher results in the life skills acquisition questionnaire (LSAQ) predicted higher expectations of academic achievement [$F(3, 1143) = 74.82, p < 0.001, R^2 \text{ adj.} = 0.162$]. Moreover, the LSQ was also a significant predictor of academic achievement expectations [$F(8, 1138) = 49.05, p < 0.001, R^2 \text{ adj.} = 0.251$]. Specifically, the higher the students' motivation, time management, stress management, and teamwork skills, the higher their expectations of succeeding in their academic path (cf. Table 9).

Table 9. Regression coefficients for predicting role of LSAQ and LSQ on AAEs.

	<i>b</i>	SE	β	<i>t</i>	<i>p</i>
LSAQ	0.390	0.026	0.406	14.96	<0.001
LSQ					
Motivation	0.210	0.032	0.230	6.60	<0.001
Time management	0.096	0.024	0.126	4.03	<0.001
Stress management	0.052	0.022	0.076	2.37	0.018
Communication	0.028	0.025	0.034	1.11	0.269
Teamwork	0.156	0.031	0.178	5.00	<0.001
Leadership	0.032	0.028	0.040	1.13	0.259

3.7. Step 7: Preliminary and Exploratory Test–Retest Analysis (Temporal Stability)

Because logistical constraints prevented a follow-up assessment of the original validation sample, temporal stability was examined on a different and independent sample of 102 university psychology students ($M_{\text{age}} = 23.35, SD = 7.34$; 91% female; Year: 16% 1st-year, 35% 2nd-year, 28% 3rd-year, 21% 4th-year), selected for testing temporal stability. Participants completed the LSAQ and LSQ twice (T1, T2), two weeks apart. To evaluate the scales' temporal stability, the intraclass correlation coefficient (ICC) was used. A two-way random-effects model with absolute agreement and single measures [ICC (2,1)] was selected [45]. LSAQ showed a good (>0.75) temporal stability for the overall score (and moderate-to-good stability for the subscales) over the two-week interval. Regarding the LSQ, all dimensions showed a moderate (between 0.50–0.74) temporal stability, except for the Time Management subscale, which showed a good temporal stability (cf. Table 10). The final versions of both instruments (LSQ and LSAQ) are included in this paper (see Appendices A and B).

Table 10. Descriptive statistics for T1 and T2, and Intraclass Correlation Coefficient results for LSAQ and LSQ.

	T1		T2		ICC (2,1)	95% CI	Interpretation
	<i>M (SD)</i>	α	<i>M (SD)</i>	α			
LSAQ	3.64 (0.52)	0.92	3.66 (0.56)	0.93	0.846	[0.781, 0.894]	Good
Motivation	3.92 (0.65)	0.86	0.78 (0.64)	0.85	0.694	[0.568, 0.786]	Moderate
Learning	3.81 (0.57)	0.81	3.86 (0.58)	0.83	0.653	[0.526, 0.752]	Moderate
Automatization	3.22 (0.83)	0.92	3.32 (0.83)	0.94	0.814	[0.736, 0.871]	Good
Transference	3.64 (0.83)	0.87	3.67 (0.59)	0.88	0.738	[0.636, 0.815]	Moderate
Life Skills Questionnaire							
Motivation	3.78 (0.55)	0.61	3.74 (0.54)	0.70	0.708	[0.596, 0.793]	Moderate
Time Management	3.59 (0.71)	0.77	3.57 (0.70)	0.81	0.784	[0.696, 0.849]	Good
Stress management	3.34 (0.66)	0.86	3.23 (0.67)	0.84	0.702	[0.587, 0.789]	Moderate
Communication	3.72 (0.60)	0.79	3.74 (0.61)	0.76	0.584	[0.440, 0.699]	Moderate
Teamwork	4.25 (0.58)	0.90	4.22 (0.60)	0.92	0.570	[0.423, 0.698]	Moderate
Leadership	3.95 (0.70)	0.85	3.96 (0.65)	0.78	0.700	[0.586, 0.787]	Moderate

4. Discussion

This study analyzed the validity of two related measures of life skills to be used with people of different ages, and which may represent useful tools for understanding which life skills are learned (LSQ) and how they progress throughout the process of acquiring and using them in distinct life situations (LSAQ). Data obtained in this study reinforced two main aspects.

First, in general, the LSQ and the LSAQ seem to be valid instruments in terms of validity and reliability, following the ‘best practice’ recommendations for psychological instrument development [16]. Starting with the LSQ, the results posit a six-factor structure, supporting the validity of the instrument for the 18-item version (instead of the 24-item version). However, the motivation dimension displayed weaker psychometric properties than the remaining LSQ factors. Specifically, the lower discriminant validity suggests that participants seem to have difficulties in differentiating this construct from the remaining life skills. A possible explanation for this finding is that motivation may function as a foundational self-regulatory resource, rather than as a fully independent life skill. Within the Life Skills Efficacy Model [7], motivation represents an important mechanism supporting the acquisition and enactment of adaptive behaviors. Consequently, individuals who report high levels of motivation may also be more likely to perceive themselves as more capable of organizing their time effectively, managing stress, communicating with others, and engaging constructively in teamwork and leadership activities. From this perspective, the overlap observed between motivation and the remaining life skills may reflect genuine conceptual interdependence, rather than measurement error alone. In addition to concerns regarding discriminant validity, the composite reliability coefficient in the validation sample was below the conventional criterion typically recommended for established measures. Nevertheless, motivation was retained for both theoretical and methodological reasons. From a measurement perspective, these findings suggest that the current operationalization of motivation may require further development and findings involving this dimension should be interpreted with caution. It is important to note that the LSQ is a newly developed instrument, and recommendations for scale development suggest that psychometric decisions should not rely exclusively on fixed cut-off values, particularly in the early stages of instrument validation and when dimensions are represented by a limited number of items [34]. Moreover, the dimension showed acceptable factor loadings and its factorial structure remained stable across analyses. Additionally, from a theoretical perspective, motivation maintained conceptual coherence within the overall framework, as it represents

a central component of the Life Skills Efficacy Model [7], supporting the acquisition and enactment of other life skills. In sum, these results suggest that the boundaries of the motivation construct require further investigation. For practitioners, the findings recommend caution when interpreting motivation scores as completely independent from other life skills dimensions. Instead, motivation may be better understood as a broad self-regulatory resource that contributes to the expression of multiple life skills.

It is also important to note that the LSQ covers intrapersonal cognitive abilities (e.g., motivation, time management), intrapersonal emotional abilities (e.g., stress management), and interpersonal abilities (e.g., communication, teamwork, and leadership). These abilities represent distinct levels of human functioning and seem quite similar to other instruments aimed at young people, particularly in sports. For example, the Life Skills Scale for Sport (LSSS) [21] measures dimensions related to emotional regulation skills, goal setting, time management, problem-solving, social skills, interpersonal communication, teamwork, and leadership. These similarities in dimensions evaluated by both instruments seem to denote relevant domains of life skills that people can learn in their lives. For example, Johnston et al. [46] analyzed 34 papers related to sports contexts and found that the skills evaluated by the LSSS were cited 95 times in 34 related papers. Thus, the LSQ aligns with the need to evaluate a broad range of life skills because there are indications that they are related to several positive outcomes in distinct contexts, as is the case of academic achievement in educational contexts [32,33], goal setting and performance in sports contexts [47], adjustment and performance in the workplace [48,49], and even general psychological wellbeing [18,50]. In the present study, predictive validity was examined through students' academic achievement expectations. Therefore, the observed associations should be interpreted as evidence that life skills are related to students' expectations and perceptions regarding future academic success, rather than to objective indicators of academic achievement. Although academic expectations represent an important educational outcome and may influence future behavior and performance, they do not constitute direct evidence of academic attainment.

Furthermore, the selection of life skills for the LSQ followed the theoretical distinction between personal life skills (as is the case for motivation, time management, and stress management skills) and interpersonal skills (as is the case for communication, teamwork, and leadership), and covers distinct levels of human functioning, namely the cognitive level (related to the applied thinking involved in communication, teamwork, and leadership life skills), the intellectual level (related to the abstract thinking involved in the life skills of how to be motivated or how to manage time), and the emotional level (related to regulating emotions involved in stress management life skills). This categorization corroborates the literature about how to organize life skills. For example, Danish et al. [6] indicated that life skills can be cognitive (making effective decisions), intrapersonal (setting goals), behavioral (communicating effectively with peers and adults), interpersonal (being assertive), and even physical (e.g., adopting the right posture). Hermens et al. [51] proposed an organization into emotional (e.g., mood regulation), cognitive (e.g., initiative), and social (e.g., empathy toward others) life skills. Finally, Gomes and Resende [7] advanced the possibility of organizing life skills by typology (cognitive, intellectual, emotional, motor, and physical) and by functionality (from personal to interpersonal life skills). It is also important to refer to the fact that the dimensions identified in the LSQ share common features with socioemotional learning frameworks, particularly regarding self-management and interpersonal functioning. Therefore, we do not interpret life skills as a completely independent construct. Instead, we comply with the view that life skills represent an applied and context-oriented framework through which socioemotional competencies are mobilized to address everyday demands and challenges. From this perspective, the LSQ may be viewed as assessing

the practical manifestation of cognitive, emotional, and interpersonal competencies that facilitate successful adaptation across life domains. In synthesis, the LSQ can now be used to empirically test all these frameworks of life skills organization.

Second, results from the LSAQ revealed good psychometric properties. The results support either a four-factor structure or a second-order latent factor, both covering the major stages of life skills acquisition (motivation, learning, automatization, and transference). An additional finding that deserves further consideration concerns the prominent role of the automatization dimension during the exploratory analyses. Specifically, automatization accounted for a substantial proportion of the explained variance when compared with the remaining stages of life skills acquisition. One possible interpretation is that adolescents may recognize and evaluate their life skills more easily when these are already incorporated into their daily behavioral routines. In contrast, earlier stages such as motivation and learning may be less readily differentiated because they involve more internal and reflective processes that are not always explicitly recognized by individuals. This interpretation is consistent with the Life Skills Efficacy Model, which proposes that life skills acquisition progresses through motivation, learning, automatization, and transference, with automatization representing the stage at which life skills become sufficiently practiced and integrated to support effective adaptation across situations [7]. Furthermore, previous literature has suggested that repeated opportunities to learn, practice, and apply life skills facilitate their integration into everyday functioning, increasing the likelihood that individuals perceive these skills as part of their regular behavioral repertoire [3,13,14]. From this perspective, the stronger contribution of automatization may indicate that participants base their self-assessments primarily on the extent to which life skills are already enacted in everyday life, rather than on their motivation to learn such skills or on their awareness of the learning process itself.

Interestingly, this finding may also help explain why the distinction between some acquisition stages was less evident than theoretically expected. It seems plausible that, from the participants' point of view, the stage of the skill they are evaluating might not be so clear, thereby supporting a second-order latent factor. The limited discriminant validity observed among the four stages deserves further consideration. The strong associations between motivation, learning, automatization, and transference may indicate that these stages operate as highly interconnected aspects of a broader life skills acquisition process, rather than as completely independent dimensions. This interpretation is theoretically compatible with the Life Skills Efficacy Model [7], in which the stages are expected to function sequentially and interactively, with progress in one stage facilitating development in subsequent stages. Consequently, substantial overlap between stages may be expected. Therefore, the lack of discriminant validity should not be interpreted as definitive evidence against the proposed model. From this perspective, the second-order factor solution may represent the most parsimonious representation of life skills acquisition at the global level, while the four-factor solution retains practical value by allowing researchers and practitioners to examine specific stages of the acquisition process. Therefore, rather than viewing the first-order and second-order solutions as competing explanations, the present findings suggest that they may represent complementary ways of understanding life skills acquisition, capturing both the overall coherence and its constituent developmental stages. Moreover, the results from the calibration sample showed discriminant validity between the factors—from an intervention point of view, the differentiation between stages is important and, therefore, measuring the four dimensions may be more useful. Thus, the next step is to use the instrument to test the process of learning and using life skills. In fact, there is a need to understand the factors that contribute to the learning and development of life skills [52], since it remains unclear how they are spread across distinct life contexts [31]. For

example, some authors suggest that life skills are transferred across multiple contexts [53] and that they can be learned throughout distinct stages [7]. However, it is still not clear how life skills are developed and what factors influence the learning process, meaning that measuring this process may indeed help to comprehend the complexities beyond what it means to acquire and to use life skills. Also important is the fact that measures of life skills stages can shed some light on the dilemma of knowing whether life skills are better learned implicitly or explicitly [17] by comparing the distinct stages which are more or less prevalent in individuals included in life skills intervention programs (explicit approach) versus those in individuals not included in such interventions referring to their daily life skills (implicit approach).

In synthesis, and from a theoretical point of view, both measures can help practitioners and researchers to understand if the opportunities to learn life skills (e.g., providing an intervention program) produce an effect in the acquisition of life skills and in the type of life skills learned by the participants. Also important is the fact that both measures can help test theoretical models related to life skills, providing evidence for the mechanisms involved in the acquisition of life skills. For example, the LSAQ can help to test theoretical models of life skills: some models assume that transfer results from an ongoing process between the individual and the environment [54], while others reinforce the whole process of life skills acquisition [7]. In the case of LSQ, the instrument can help to test if some life skills are more prone than others to be acquired throughout the life skills learning process and if they are sensitive to the multiple contexts of human functioning. In fact, some studies suggest that contextual factors may influence the learning process of life skills [54,55], but there is a scarcity of findings about the possibility that some contexts promote more life skills than others. It is also worth noting that our study does not argue that life skills are conceptually independent from socioemotional competencies. Rather, it assumes that life skills constitute a broader applied framework that organizes and operationalizes psychosocial competencies according to their adaptive value for everyday functioning.

This study had some limitations. Even though both instruments evaluate, with generic logic, the type and stages of life skills learning, some item refinements might be needed. For example, the motivation dimension of the LSQ showed weaker convergent and discriminant validity than the remaining subscales. Although this result may reflect the central role of motivation as a self-regulatory resource associated with several adaptive competencies as previously discussed, it may also suggest that the current item set does not fully differentiate motivation from related life skills constructs. Future studies should examine alternative operationalizations of motivation. An additional concern refers to the need to test both instruments in other samples and countries and analyze if they are valid throughout the life cycle. Also important is the fact that predictive validity was assessed using a measure of academic achievement expectations, which evaluates students' perceptions and expectations regarding future academic success, rather than objective educational outcomes. Consequently, the present findings support associations between life skills and academic expectations, but do not demonstrate that life skills predict actual academic achievement. Future research should examine the impact resulting from life skills acquisition to other domains of human functioning (e.g., peers, groups/teams, organizations, communities, and even societies), while also gathering behavioral and objective data (e.g., students' grades, turnover at work, etc.). Such evidence would provide a stronger test of the transferability of life skills to educational settings and their practical implications for academic success. A third important limitation concerns the temporal stability analysis. Test-retest reliability was evaluated using a separate convenience sample of university students that differed substantially from the primary validation sample regarding age, educational level, and gender composition. Therefore, although the findings provide preliminary evidence of

temporal stability, they should not be interpreted as definitive evidence that the same level of stability exists among adolescents. Future studies should replicate the test–retest analyses using representative samples of high-school students and examine temporal stability across adolescents. Moreover, future research should also be conducted with participants in different human development stages to overcome the problem evident in the literature that shows that the study of life skills suffers from a bias toward young people [10,56] and to young adults in vulnerable situations [11].

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Appendix A

LSAQ—Life Skills Acquisition Questionnaire

This questionnaire assesses your life skills. Please read the instructions below FIRST, BEFORE giving your opinion.

What are life skills?

They are abilities or skills that people may possess and which help them to function better in their daily lives.

Examples of life skills:

- ✓ High motivation;
- ✓ Time management;
- ✓ Coping with stress;
- ✓ Positive communication;
- ✓ Leadership and teamwork.

Please answer the questions below by thinking about these and other life skills that may apply to your personal situation. Try to answer by thinking about your real and current life situation (and not about what you would like to happen).

Bear in mind that there are no right or wrong answers.

In Terms of My MOTIVATION Regarding Life Skills...					
	Never	Rarely	Some Times	Many Times	Always
1. I reflect on the life skills I am good at and on those I can improve	1	2	3	4	5
2. I reflect on the importance of improving my life skills	1	2	3	4	5
3. I enjoy reflecting on my life skills	1	2	3	4	5
4. I am interested in learning more about life skills	1	2	3	4	5
In Terms of My KNOWLEDGE of Life Skills...					
	Never	Rarely	Some Times	Many Times	Always
5. I know what life skills are	1	2	3	4	5
6. I know which life skills are most important for me personally	1	2	3	4	5
7. I know how life skills can help me personally	1	2	3	4	5
8. I know how to use life skills	1	2	3	4	5
In Terms of My Tendency to PRACTICE Life Skills...					
	Never	Rarely	Some Times	Many Times	Always
9. I practice and rehearse life skills before applying them in my daily life	1	2	3	4	5
10. I try to master life skills before using them in my daily life	1	2	3	4	5
11. I practice my life skills so that I feel confident when using them	1	2	3	4	5
12. I practice life skills before applying them in real-life situations	1	2	3	4	5
In Terms of My USE of Life Skills in Specific Everyday Situations...					
	Never	Rarely	Some Times	Many Times	Always
13. In everyday situations, I know how to use different life skills depending on the challenges I face	1	2	3	4	5
14. When faced with a real-life challenge in my day-to-day life, I know how to put my life skills into practice	1	2	3	4	5
15. In new situations, I know how to choose which life skills to use	1	2	3	4	5
16. When I learn how to use a life skill in my daily life, I try to apply it in other areas of my life	1	2	3	4	5

LSAQ Codification

1. Motivation: 1, 2, 3, 4
2. Learning: 5, 6, 7, 8

3. Automatization: 9, 10, 11, 12
4. Transference: 13, 14, 15, 16

Note: the items were first used in Portuguese language and then they were translated to English using a back-translation method. The final version was revised by an English-native speaker. However, future studies may analyse the appropriateness of the translation.

Appendix B

LSQ—Life Skills Questionnaire

This questionnaire assesses a range of skills and abilities related to your daily functioning. Using the scale below (from “Never” to “Always”), please indicate to what extent each statement applies to you personally. Try to answer by thinking about your real and current life situation (and not about what you would like to happen). Please bear in mind that there are no right or wrong answers.

Table A1. LSQ.

	Never	Rarely	Sometimes	Often	Always
1. I know which goals I want to achieve	1	2	3	4	5
2. I make action plans when I want to achieve something important to me	1	2	3	4	5
3. I know exactly what to do to overcome the problems/obstacles that might prevent me from achieving my goals	1	2	3	4	5
4. I can organise my schedule according to the activities I need to complete	1	2	3	4	5
5. I can overcome any difficulties that might prevent me from following my schedule	1	2	3	4	5
6. I stick to the time I planned for my activities, whether I enjoy them or not	1	2	3	4	5
7. I can deal well with situations that might make me nervous	1	2	3	4	5
8. I know how to stay optimistic and confident when facing a difficult problem	1	2	3	4	5
9. I can calm myself down when I feel nervous	1	2	3	4	5
10. I know how to speak when I need to correct someone or draw attention to an issue	1	2	3	4	5
11. I know how to communicate effectively when I am angry with someone	1	2	3	4	5
12. I can speak calmly even when I disagree with someone	1	2	3	4	5
13. When working in a group or team, I help my colleagues define what we need to achieve	1	2	3	4	5
14. When working in a group or team, I help my colleagues to define each person's roles and responsibilities	1	2	3	4	5
15. When working in a group or team, I help my colleagues to define how we will work together	1	2	3	4	5
16. When I am in charge (“leader”) of a team or group, I know how to help make our goals positive and meaningful for everyone involved	1	2	3	4	5
17. When I am in charge (“leader”) of a team or group, I explain how everyone can support a colleague who is having difficulties	1	2	3	4	5
18. When I am in charge (“leader”) of a team or group, I explain to everyone involved what each person should do	1	2	3	4	5

Table A2. LSQ codification.

LSQ Codification	
1. Motivation: 1, 2, 3	4. Communication: 10, 11, 12
2. Time management: 4, 5, 6	5. Teamwork: 13, 14, 15
3. Stress management: 7, 8, 9	6. Leadership: 16, 17, 18

Note: the items were first used in Portuguese language and then they were translated to English using the back-translation method. The final version was revised by an English-native speaker. However, future studies may analyse the appropriateness of the translation.

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