Title: **Recent stressful life events (SLE) and adolescent mental health: initial validation of the LEIA, a new checklist for SLE assessment according to their severity, interpersonal and dependent nature**

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Abstract

The main aim of the present study was to develop and validate a checklist for adolescents, the Life Events Inventory for Adolescents (LEIA), for screening stressful life events (SLE) of different nature (major-minor, dependent-independent, personal-interpersonal). The LEIA was administered together with another SLE checklist (Escala de Acontecimientos Vitales [Life Events Scale], EAV), and with measures of life satisfaction and externalizing and internalizing symptoms. The results showed that the Kappa and the percentage agreement reliability indices were adequate. Regarding validity evidences, the correlations found between the LEIA and the EAV ranged from .65 to .69, and between the LEIA and the psychopathological symptoms ranged from .26 to .38. Specifically, major dependent non interpersonal SLEs were the best predictors of externalizing psychopathology; while major independent non-interpersonal SLEs were the best predictors of internalizing symptoms and low life satisfaction. To conclude, the LEIA could be considered an adequate checklist to screen for SLEs in adolescents.

Keywords: stressful life events, dependent, interpersonal, externalizing, internalizing, life satisfaction, adolescence

Introduction

Adolescence is a key period of transition from childhood to adulthood. Adolescents have to adapt to multiple biological and physical changes that pubertal maturation involves, and they face new social challenges within the family, among their peers and at school (Crone & Dahl, 2012; Hollenstein & Lougheed, 2013). These changes lead to cognitive transformations, mood disruption, and personality changes in self-regulation, disinhibition and conflictiveness (Denissen, van Aken, Penke, & Wood, 2013; Ibáñez et al., 2016). Therefore adolescence has been conceptualized as a period of vulnerability during which some mental disorders present their prodromal phase (Casey, Jones, & Hare, 2008; Patton et al., 2014; Wittchen et al., 2011). Accordingly, the prevalence of common mental disorders during adolescence tends to be high, with estimations in the range of 25% to 45% (Merikangas et al., 2011; Patton et al., 2014; Wittchen et al., 2011). Moreover, episodes of mental disorder in adolescence seem to increase the risk of disorders later, in adulthood (Clark, Rodgers, Caldwell, Power, & Stansfeld, 2007; Copeland, Shanahan, Costello, & Angold, 2009; Patton et al., 2014)

An important factor in the initiation and chronification of mental disorders during this sensitive developmental period is stress (Gee & Casey, 2015; Holder & Blaustein, 2014; Grant, Compas, Thurm, McMahon & Gipson, 2004). It have been proposed that the experience of multiple stressors in adolescence increases the likelihood of developing psychiatric symptoms through their action on psychobiological systems involved in emotional and coping responses to threats. Such systems include the amygdala (Swartz, Williamson, & Hariri, 2015), serotonergic neurotransmission (Caspi, Hariri, Holmes, Uher, & Moffitt, 2010) and the hypothalamic-pituitary-adrenal (HPA) axis (Miller, Chen, & Zhou, 2007), and the action would be in part through epigenetic mechanisms

linked to them (Palma-Gudiel, Córdova-Palomera, Leza, & Fañanás, 2015; van der

Knaap et al., 2014).

Stress involves an organism's adaptation to any challenging situation or set of external

demands that requires expending resources to cope with its circumstances (Monroe,

2008; Shields & Slavich, 2017). Research on stressful events has explored from extreme

traumatic experiences (Gilbert et al., 2009; Van Der Kolk, Roth, Pelcovitz, Sunday, &

Spinazzola, 2005); to mild to severe negative life incidents, or stressful life events (SLE;

Grant et al., 2004; Monroe, 2008; Shields & Slavich, 2017); until minor quotidian

disturbances, or daily hassles (Kanner, Coyne, Schaefer, & Lazarus, 1981; Trianes et al.,

2009).

For SLE, the most common study estimating their relevance on psychopathology

focuses on short-term effects of acute life events, typically a recall period of no more

than one year, and their assessment has been performed through two main methods:

interviews and checklists (Kessler, 1997; Shields & Slavich, 2017; Turner & Wheaton,

1997). Interviews are considered to be more accurate and effective in predicting

outcomes than self-report checklists; but they have to be individually administered,

demand much time of researchers and participants, and involve a high cost in personnel

(Dohrenwend, 2006; Harkness & Monroe, 2016; Shields & Slavich, 2017; Wethington,

Brown, & Kessler, 1997). Conversely, self-report checklists demand little time of

researcher and participant, are easy to administer and score, and can be administered

collectively (Dohrenwend, 2006; Grant et al. 2004; Turner and Wheaton, 1997). Thus,

when time and personnel are limited, such as in research involving large samples and a

wide battery of tests, the checklists constitute a cost-effective tool for SLE screening

(Duggal et al., 2000; Lewinsohn, Rohde, & Gau, 2003; Wagner, Abela, & Brozina,

2006).

There is compelling evidence that SLEs are related to adolescent mental health (Grant et al., 2004). A meta-analysis performed by March-Llanes, Marqués-Feixa, Mezquita, Fañanás & Moya-Higueras, (2017) confirmed that during adolescence, SLEs were strongly associated with internalizing pathology and its symptoms (such as depression, anxiety or somatic complaints), but also with externalizing disorders (such as attention problems, aggressive behavior or conduct problems), both in cross-sectional and longitudinal studies. Interestingly, the authors did not find significant differences in the magnitude of these associations as a function of the assessment method, interview vs checklist, in agreement with some previous findings (Duggal et al., 2000; Lewinsohn et al., 2003; Wagner et al., 2006).

However, the role of proximal SLEs in other areas is not so clear. For example, their connection with psychosis (Beards et al., 2013) or alcohol use (Veenstra et al., 2006) is far from completely consistent; and their moderator role on some mental disorders reported in gene–environment interaction studies (e.g. Caspi et al., 2003; Covault et al., 2007) has not always been replicated (Risch et al., 2009; Todkar, Nilsson, Oreland, Hodgins, & Comasco, 2013). One of the possible explanations of these and other inconsistencies is the psychometric deficiencies that SLE checklists often present (Beards et al., 2013; Compas, Davis, Forsythe, & Wagner, 1987; Grant et al., 2004; Monroe & Reid, 2008). Thus, the use of standardized checklists with reliable scores and adequate sources or validity evidences for the assessment of SLEs would increase the reliability of results, would facilitate replication and comparability of studies, and would help to disentangle more specific issues regarding the association of SLEs and health (Grant et al., 2004; Turner & Wheaton, 1997).

Some recommendations for increasing the psychometric quality of SLE checklists can be derived from reviews of the topic (e.g. Dohrenwend, 2006; Grant et al., 2004;

Hammen, 2005; Harkness & Monroe, 2016; Kessler, 1997; Rabkin & Struening, 1976; Turner & Wheaton, 1997; Zimmerman, 1983). A basic psychometric requirement when dealing with SLEs is to report the scores' reliability properly, but most studies either do not test the reliability of the scores or use traditional reliability methodologies (such as the Cronbach alpha or test–retest coefficients) that are inadequate in the case of SLEs. Measures of internal consistency are inappropriate because there is no underlying assumption that items should covary (Harkness & Monroe, 2016); whereas test–retest reliabilities of aggregated SLEs do not guarantee that a same score in test and retest can be attributed to the aggregation of the same events on both occasions (Zimmerman, 1983a). A more adequate alternative is to administer the checklist at two different moments and to evaluate the appearance of each specific SLE (Turner & Wheaton, 1997) using kappa values together with the percentage of agreement (McHugh, 2012). Some validation studies of SLE checklists in adults have reported both statistics (e.g. Gray, Litz, Hsu & Lombardo, 2004), but we are not aware of any checklist for adolescents that has used this procedure.

Another important question in the assessment of SLEs is how to estimate and quantify their degree of impact. The simplest and most usual way is to calculate the total number of SLEs experienced. However, one problem with this procedure is that it implies that each event has the same impact potential; e.g., the death of one's mother is considered to have the same potential impact as an argument with a friend (Zimmerman, 1983a). So checklists that include *weighted* SLEs have been proposed as a better option (Compas et al., 1987; Kessler, 1997). The most commonly used procedures to weight the SLEs in checklists are their objective and subjective weighting (Harkness & Monroe, 2016; Kessler, 1997; Turner & Wheaton, 1997). In the objective or consensual procedure, a panel of raters generates weights for each event (Holmes & Rahe, 1967);

whereas in the subjective procedure, each respondent assigns a subjective weight to his or her own events (Sarason, Johnson & Siegel, 1978). Regarding the objective procedure, an important criticism is that all life events of a given type are treated as equivalent for any person (Kessler, 1997); e.g., the death of an adolescent's father would have the same weight irrespective of if he lived with the child or if he abandoned the home years ago. One strategy to tackle this problem is to ask participants to rate subjectively the emotional impact each SLE had on them (Kessler, 1997; Zimmerman, 1983a). This procedure assumes that the subjective emotional reactivity to stressors, or appraisal, constitutes a more relevant risk factor for certain disorders than the mere occurrence of the stressful experience (Conway, Hammen, & Brennan, 2012; Espejo, Hammen, & Brennan, 2012; Holtzman et al., 2013), in accordance with cognitive theories of vulnerability to mental disorders such as depression (Alloy, Abramson, & Francis, 1999). Accordingly, several studies have reported higher associations between adverse psychological outcomes and the subjective scoring procedure than the objective weighting or the simple count procedure (Calvete, Villardón, Estévez, & Espina, 2007; Espejo et al., 2012; Sarason et al., 1978); although these findings have not always been replicated (Ferreira, Granero, Noorian, Romero, & Domènech Llaberia, 2012; King, Pedersen, Louie, Pelham, & Molina, 2017; Zimmerman, 1983b).

Finally, another important recommendation for increasing the validity evidence for an SLE assessment is to take into account different typologies of life events (Grant et al., 2004; Hammen, 2005; Vrshek-Schallhorn et al., 2015). A relevant distinction between SLEs is their dependent vs independent nature; which refers to those life events that occur (in part) because of a person's own characteristics or behaviors (dependent or controllable) and events whose occurrence is most likely unrelated to the respondent's own behavior (independent or incontrollable). It has been found that dependent SLEs

have a substantially higher heritability estimate than independent SLEs in adult and adolescent samples (Johnson, Rhee, Whisman, Corley, & Hewitt, 2013; Kendler & Baker, 2007). This indicates that genetically-based personal characteristics may be involved in the seeking out, creation or evocation of dependent SLEs. In addition, the interpersonal dimension (those that directly affect relationships with others vs those that are experienced mainly by the respondent) also seems to be significant in SLE analysis, especially with regard to certain mental disorders such as depression (Hammen, 2005). Last, another relevant SLE typology is their moderate-to-severe negative impact (*major* SLEs) vs those with less than moderate impact (*minor* SLEs; Compas, 1987; Kendler et al., 1995).

Despite the importance of systematically examining which types of life events may be more relevant for different mental health outcomes, research on this topic is relatively scarce and has almost exclusively focused on the dependent interpersonal SLE combination. Dependent interpersonal SLEs are consistently associated with depressive symptoms and disorders in adolescents (Cohen et al., 2013; Espina & Calvete, 2017; Flynn, Kecmanovic, & Alloy, 2010; Flynn & Rudolph, 2011; Hankin, Stone, & Wright, 2010; Krackow & Rudolph, 2008; Rudolph et al., 2000; Shapero, Hankin, & Barrocas, 2013); and, according to the *stress generation theory* (Hammen, 1991, 2005), they are predicted by prior depression (Conway et al., 2012; Espina & Calvete, 2017; Hamilton et al., 2014; Harkness & Stewart, 2009). However, research examining the role of other types of SLEs on mental health outcomes is almost nonexistent. One noteworthy exception is the work of Vrshek-Schallhorn et al. (2015), which examined the predictive role of different types of SLE on the onset of depression disorders in emerging adulthood, categorizing them as a function of their interpersonal–non-interpersonal, dependent–independent, major–minor, and chronic–episodic

characteristics. The main results of that study indicated that major interpersonal dependent and independent SLEs, together with chronic interpersonal SLEs, predicted the onset of depression. As far as we know, the issue of whether this pattern of results is replicated in other samples, in other lifespan stages such as adolescence, or in other mental health outcomes beyond depression, has not been explored.

Hence, the main aim of the present study was to develop a new SLE checklist, the Life Events Inventory for Adolescents (LEIA), following the recommendations mentioned above. The LEIA is intended to be a suitable screening instrument for large-scale research that offers advantages over other SLE checklists for adolescents. Past checklists were developed to give two main scores: i) the aggregated occurrence of the SLEs and ii) an objective or a subjective score of the impact of each SLE, but not both of them. The LEIA allows the assessment of the occurrence of SLEs and their subjective impact for each adolescent, and it also generates an estimate of objective severity based on the mean impact of each event in the sample. These different scoring procedures may allow empirical testing of which SLE scoring method better predicts different mental health outcomes in adolescence. In addition, past checklists did not categorize properly the SLEs according to their interpersonal–non-interpersonal and dependent–independent nature. The LEIA gives open information about this classification, thereby allowing us to replicate in adolescence the findings of Vrshek-Schallhorn et al. (2015), and to extend the exploration of the differential impact that these types of SLEs may have on other mental health outcomes. To this end, here we examine their associations with internalizing symptoms such as depression, anxiety and somatization; with externalizing symptoms such as aggressivity, attention problems and antisocial behavior; and with subjective life satisfaction. Furthermore, we examine convergent validity by means of its association with another checklist that has been

validated in Spanish adolescents: the Escala de Acontecimientos Vitales [Life Events Scale] (EAV; Mardomingo & González Garrido, 1990). Finally, we estimate the reliability of the LEIA's scores using the percentage of congruence between test and retest, and by estimating the kappa and the linear weighted kappa statistics (Fleiss, Levin & Cho, 2003). To the best of our knowledge, no previous SLE validation study has used this methodology to examine the reliability in the reporting of both the occurrence of SLEs and their subjective impact.

Method

Participants

Of the 1106 students invited to participate from two public high schools in the urban area of Castellón de la Plana, a city in eastern Spain, 835 returned signed written parental consent. Of these, 51 participants did not attend the two assessment sessions or did not respond to all the questionnaires. Thus, the final sample consisted on 784 adolescents (49.9% were girls), and the mean age of the sample was 14.31 (SD = 1.59; age range = 12-17 years old). Moreover, 27.8% were 8th year students (48.1% girls, mean age 12.59, SD = .70); 22% were 9th year students (52.6% girls, mean age 13.68, SD = .83); 19.2% were 10th year students (43.6% girls, mean age 14.62, SD = .76); 16.6% were 11th year students (50.4% girls, mean age 15.70, SD = .83); 2.8% were vocational training students (60.9% girls, mean age 16.61, SD = .66) and 11.6% were students of further education, preparing for university (56.7% girls, mean age 16.41, SD = .63). Around half of their fathers and mothers (56.3% and 55.9% respectively) had successfully completed high school, but not continued on to higher education; whereas 26.3% of the fathers and 28.9% of the mothers had a university degree. The mean income was equivalent to that of a middle-class Spanish family and 24.1% of the

sample were not from Spain (all of them showed an appropriate level of Spanish

according to teacher's reports). All the questionnaires were administered in Spanish.

The LEIA checklist was re-administered 1 month later, to determine the test–retest

reliability in a subsample of 365 adolescents. This subsample was socio-

demographically equivalent to the subgroup of adolescents who did not participate in

the retest (age: t (782) = 1.01, p = .31; gender: t (782) = 1.04, p = .30; estimated family

income: t (782) = -.88, p = .38; studies of the mother: t (782) = -1.66, p = .10; academic

marks: t (782) = .50, p = .62), except for the level of education of the father, which was

lower in the adolescents who did not participate in the retest (t (782) = -5.30, p = .00).

Some significant differences were found between the subsamples in health outcome

scales and some LEIA scores, although the effect size of these differences was trivial or

very small (see Table 1). As this subsample was only used to assess the test–retest

reliability, these differences should not affect the results.

Instruments

Life events inventory for adolescents (LEIA). This instrument for 12 to 17 years old

adolescents includes 75 SLEs, plus an open-ended question. Specific items were created

via inspection of some of the most used SLE instruments (most of them with a

validation study in Spain or developed for Spanish populations), and their formulation

was adapted to adolescents and updated to contemporary language when necessary:

Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967; Spanish adaptation of

González de Rivera & Morera Fumero, 1983), Life Experiences Survey (LES; Sarason,

Johnson & Siegel, 1978), Adolcescent Life Change Event Scale (ALCES; Spanish

adaptation of Voltas, Aparicio, Arija, & Canals, 2015), Life Events Scale for Students

(LESS; Clements & Turpin, 1996), Life Events Questionnaire (LEQ; Newcomb, Huba

& Bentler, 1981), List of Threatening Experiences Questionnaire (LTE-Q; Brugha &

Cragg, 1990; Spanish adaptation of Motrico et al., 2013), Life Events Checklist (LEC; Johnson & McCutcheon, 1980), EAV (Mardomingo & González Garrido, 1990), Inventario de Acontecimientos Vitales Estresantes [Stressful Life Events Inventory] (IAVE; Oliva, Jiménez, Parra, & Sánchez-Queija, 2008) and Cuestionario de Sucesos Vitales [Questionnaire of Life Events] (CSV; Sandín & Chorot, 2017). As positive desirable SLEs tend to show non significant associations with mental disorders (Kessler, 1997; Sarason, Johnson & Siegel, 1978), and following the recommendations in Turner & Weaton (1997), only negative life events were included. In addition, other SLEs traditionally not assessed in SLE checklists were also incorporated, such as items related to bullying victimization. The respondents had to mark whether each SLE had occurred during the previous 12 months, in line with most of the checklists reviewed. If an SLE was experienced, then participants had to rate the magnitude of the negative impact, on a 5-point Likert scale (0 = *nothing* to 4 = *extremely*) with a pictographic aid (a representation of gradually sadder faces) The Spanish full-version of the instrument is showed in the Suppl. Material.

Three different principal scores were calculated with the LEIA. First, a quantity score was calculated by adding up the SLEs that occurred for the participants (*LEIA quantity*). Second, a subjective weighted score was obtained by adding the subjective negative impact of each SLE (*LEIA subjective severity*). Last, an "objective" weighted score was derived by summing each SLE experienced weighted by the mean of the subjective negative impact for that SLE in the sample (*LEIA objective severity*). The mean impact for each event is presented in the Table 2.

To determine SLE typologies, 10 researchers, experts in the field, rated each life event in three dimensions. First, using a 5-point Likert scale (0 = *completely independent* to 4 = *completely dependent*), they estimated whether a life event was more or less

dependent of the behavior of the respondent. When a life event had a mean score equal to or greater than 2 in this dependent–independent dimension, it was considered dependent. Second, the raters decided the social nature of the life event (0 = *non-interpersonal* to 1 = *interpersonal*). When a life event had a mean score equal or greater than .5 in the social dimension, it was considered interpersonal. These procedures were similar to those usually applied in studies that explore the combination of dependent interpersonal SLEs (e.g. Krackow & Rudolph, 2008). Lastly, we used the mean impact ratings of the adolescents to estimate the major vs minor category. When a life event had a mean score lower than 2.5, it was designated as minor (n = 9), whereas SLEs scoring greater than 2.5 were coded as major (severe and moderate; n = 66). The cut-off criterion of 2.5 follows the procedure used in Vrsheck-Schallhorn et al. (2015). Due to the small number of minor events, and the fact that minor SLEs were not associated with mental health outcomes when controlling for major events (see results section), we decided to combine only major events with the dependent vs independent and interpersonal vs non-interpersonal domains. Thus, a total of 37 life events were classified as major independent interpersonal, 5 were considered major independent non-interpersonal, 16 were considered major dependent interpersonal and 8 were major dependent non-interpersonal (see Table 2).

Life events scale (Escala de Acontecimientos Vitales, EAV*;* Mardomingo & González Garrido, 1990). The EAV is an SLE scale frequently used in clinical psychology and psychiatric settings in Spain. This instrument was created following the SRRS of Holmes & Rahe (1967) and consists of 47 SLEs. Participants indicate whether the life event had occurred during the previous 12 months. The outcome of the checklist results from the weighted sum of each SLE experienced, multiplied by its Life Change Unit (LCU) score (*EAV total score*).

Assessment system of children and adolescents (SENA; Sánchez-Sánchez, Fernández-pinto, Santamaría, Carrasco & Barrio, 2016). The SENA is a self-report instrument for assessing some of the most common psychopathological problems that occur during adolescence. Participants indicate the frequency of the appearance of different behavior descriptions on a 5-point Likert scale (0 = *Never or almost never* to 4 = *Always or almost always*). For the present research, only some SENA scales were used: depression (14 items), anxiety (10 items), somatic complaints (9 items), aggressive behavior (7 items), attention problems (10 items), and antisocial behavior (8 items). We also obtained the internalizing and externalizing spectra scores by summing the scores of the first three scales and the second three, respectively. The reliability scores obtained in present sample were adequate (see Table 1).

Student's Life Satisfaction Scale (SLSS; Huebner, 1991; Spanish adaptation of Galindez & Casas, 2010). The SLSS asks the extent to which the adolescents agree with 7 general statements about their life, on a 6-point Likert scale (0 = *Strongly disagree* to 5 = *Strongly agree*). A total score that estimates global life satisfaction, a core component of subjective well-being or happiness, is calculated by summing the responses. SLSS alpha scores' reliability in our sample was adequate (see Table 1), and similar to the original coefficient.

Procedure

This study was part of broader research into psychosocial risk and protective factors affecting mental health during adolescence. After obtaining the approval of the two School Boards, research leaders GO and MII presented the study to the teachers and parents at the first meeting of the school year. In this meeting, consent information documents were handed out to parents or legal guardians. Once the consent documents were returned, trained research assistants administered, in groups, in the classrooms, a

sociodemographic survey together with the rest of the battery of questionnaires in two sessions separated by one week. Research assistants gave detailed instructions to the students, highlighted the confidentiality of the data and the importance of giving honest responses, and helped the students whenever necessary. The questionnaires were voluntarily completed by those students authorized by their parents or legal guardians. The LEIA checklist was re-administered together with the EAV one month later, to study the test–retest reliability and their convergent validity in a subsample of students.

Ethics

This research was approved by the ethical committee from the Universitat Jaume I, and authorized by the School Board of the participating high schools as well as by the regional Valencian authorities. The parents or legal guardians of the participants gave written informed consent in accordance with the Declaration of Helsinki.

Analysis

The test–retest reliability of the total score was assessed by the percentage of agreement between the two occasions and by means of the kappa coefficient, in accordance with Landis & Koch (1977). The reliability of the weighted score was calculated by the linear weighted kappa statistic (Fleiss et al., 2003), which assumes that categories are ordered (i.e., from low to high impact) and it accounts for how far apart the two ratings are.

The convergent validity of the LEIA was assessed using Pearson correlations. Also, in order to compare the magnitude of the correlations between the three LEIA scores (SLE quantity, SLE subjective severity, and SLE objective severity), we performed Williams-Hotelling t-tests (Williams, 1959). Last, the predictive power of the four combinations of life events assessed using the LEIA on different mental health outcomes was estimated by performing hierarchical linear regression analysis in two steps. The first

included age and gender, while the second consisted of the SLE types estimated with each of the three scoring methods.

Results

Descriptives

Descriptives and gender differences for age and the main outcomes of the study can be seen in Table 1. Boys and girls did not differ in the occurrence of SLEs, or in the objective LEIA scores, but they presented small differences in subjective and non-interpersonal LEIA scores. In reference to mental health outcomes, boys showed more aggressive and antisocial symptoms than girls, although the effect sizes were small. Conversely, girls showed more internalizing symptoms at the spectrum level and at the scale of each symptom, with a medium effect size. This pattern of gender differences in psychopathological symptoms is similar to what could be expected from prevalence studies during adolescence (Merikangas et al., 2011; Ormel et al., 2015).

Insert Table 1 here

Reliability

Table 2 shows the percentage of agreement between the two administration occasions and the kappa statistics for each SLE (Table 2). The median percentage of agreement was 82.04% (79.67% of SLEs had an agreement greater than 90%). The median kappa value for the occurrence of the SLEs was .45 (61.97% of the items showed a moderate to almost perfect kappa value). However, one item (item 25; see Table 2) showed very poor kappa values, so this SLE was not selected for posterior statistical analysis. Applying the Landis & Koch (1977) criteria, globally, the strength of agreement of the LEIA could be considered moderate. Last, the weighted kappa statistic also revealed

adequate levels for the emotional impact assessment, although the values were slightly

lower than the occurrence score.

Insert Table 2 here

Validity

The correlations of the LEIA scores with the EAV and with mental health outcomes can

be seen in Table 3. In brief, LEIA total scores presented high to very high correlations

with the EAV (from .65 to .69), indicating good convergent validity.

In addition, and as expected, experiencing more SLEs was associated with more

internalizing and externalizing symptoms, as well as to a lower well-being. However,

certain scoring procedures presented slightly higher correlations with mental health

outcomes than others. According to the Williams-Hotelling tests for comparing pairs of

correlations, the correlations found with the LEIA subjective severity score were

significantly higher than the LEIA quantity for internalizing scales, except for

depression ($t_{SOM}(781) = -2.19$, $p = .029$; $t_{ANX}(781) = -2.21$, $p = .027$; $t_{internalizing}(781) = -2.25$, $p = .025$

Meanwhile, the LEIA quantity score tended to be higher than the LEIA subjective

severity score for externalizing and aggressivity scales ($t_{AGG}(781) = 2.20$, $p = .028$;

$t_{externalizing}(781) = 2.26$, $p = .024$). No differences between scores existed in life

satisfaction, except for a higher correlation with the LEIA subjective severity score than

the LEIA quantity score in major dependent non-interpersonal SLEs ($t_{life\ satisfaction}(781)$

$= 2.04$, $p = .04$.).

In addition, when we divided the SLEs into minor vs major, major events were

significantly more closely related to mental health outcomes than minor SLEs. Indeed,

minor SLEs were not predictive of any outcome when they were controlled for major

SLEs (data not presented but available upon request).

Insert Table 3 here

Finally, a regression analysis was performed on each mental health outcome in order to

test the role of the four types of SLEs on mental health outcomes, controlling for age

and gender as well as for the intercorrelations between SLE types.

Initially, major independent interpersonal SLEs did not predict any psychopathological

outcome (data not presented but available upon request). However, most research on

SLEs has focused on this kind of events (e.g., death of parents, health problems of

relatives, parental divorce, etc.). On closer post-hoc inspection, regressing each major

independent interpersonal SLE on all mental health outcomes, this detailed examination

revealed that item 10 (*have your parents had a heated argument*), and those SLEs

related to bullying (items 22 to 24) were predictive of depression, anxiety, somatization

and internalizing symptoms (data not presented but available upon request).

Consequently, we decided to subdivide major independent interpersonal events into two

categories, one including SLEs concerning bullying victimization, and the other with

the rest of the major independent interpersonal events.

As can be seen in Table 4, the percentage of variance explained by the SLEs for specific

psychopathological symptoms ranged from 11% for somatic symptoms to 20% for

depression symptoms and antisocial behavior. The main type of SLEs that predicted the

internalizing scales was major independent non-interpersonal SLEs. In addition, major

independent interpersonal SLEs related to bullying victimization and, to a lesser extent,

major dependent interpersonal SLEs, also predicted internalizing behavior. Regarding

the externalizing symptoms, major dependent SLEs, both non-interpersonal and interpersonal, were significant predictors, together with major independent non-interpersonal SLEs. Life satisfaction presented a similar but inverse pattern of indicators to that of internalizing symptoms, with major independent non-interpersonal SLEs, followed by major dependent interpersonal SLEs and by major independent interpersonal SLEs related to bullying victimization as predictors.

Insert Table 4 here

Discussion

The main aim of the present study was to develop a sound psychometric checklist, the LEIA, to assess SLEs in Spanish adolescents, following the main recommendations of different reviews of the topic (Compas, 1987; Dohrenwend, 2006; Grant et al., 2004; Hammen, 2005; Harkness & Monroe, 2016; Kessler, 1997; Rabkin & Struening, 1976; Turner & Wheaton, 1997; Zimmerman, 1983a). The present research found that the LEIA is adequate for research, and could also be useful in clinical settings (although more research is needed). In relation to the reliability of the scores, more than 60% of the items presented a moderate to almost perfect kappa and weighted kappa statistic (Landis & Koch, 1977), while most SLEs showed levels of agreement higher than 90%. Thus, and interpreting the results as a whole, the scores of the LEIA showed an adequate level of reliability.

However, one item presented very poor kappa statistics (item 25), although it also showed elevated agreement (98.90%). This could be a good example of how the agreement coefficient tends to overestimate interrater reliability, whereas the kappa statistic tends to underestimate interrater reliability, as noted by McHugh (2012). This

kind of results are often found when a life event affects a very low percentage of people (Gray et al., 2004), as is the case here (item 25 affected less than 0.8 % of the sample in the retest subsample at T1). Another possible reason for this low kappa reliability could be the intra-category variability (Dohrenwend, 2006). This is a typical problem for checklists and is related to how the respondent understands the description of each item; it especially affects items that are formulated in a too general or somewhat ambiguous manner. Probably, item 25, "has a classmate forced you to do things that you did not want to (give them your money, your packed lunch, etc.)", could be improved with more precise wording in the future, so its use is not recommended in its current form.

In reference to sources of validity, the correlations between the EAV and LEIA scores were high to very high, indicating good convergent validity. Taking into consideration that the EAV is based on consensual or objective weightings, it is not surprising that the EAV correlated more closely to the LEIA objective severity score than to the subjective severity score. In addition, the LEIA quantity score and LEIA objective severity score presented an almost identical pattern of associations with EAV and all mental health outcomes assessed in the present study (see Table 3). This supports some initial findings in the field that pointed to there not being much difference between simply counting the number of SLEs and readjusting each SLE using objective weights (Zimmerman, 1983b).

However, our data also showed that different scoring procedures presented small but significant differences in their association with distinct psychopathological symptoms. Thus, the LEIA subjective severity score presented significantly higher correlations with all internalizing scales, while the LEIA quantity score (and LEIA objective severity score) showed slightly higher associations with all externalizing symptoms. Therefore, our data seem to suggest that the adequate question is not which scoring

procedure is best at predicting health outcomes, as the research literature has usually discussed (e.g. Dohrenwend, 2006; Turner & Wheaton, 1997; Zimmerman, 1983b), but which scoring procedure is the best for a specific type of health outcome. Accordingly, a simple count of the number of life events would be more adequate when examining externalizing disorders; whereas measures that are weighted by the subjective impact of SLEs, or appraisal, would be more appropriate for internalizing psychopathology, in agreement with cognitive theories of depression and other emotional disorders (Alloy et al., 1999).

However, more relevant than the scoring procedure for predicting mental health outcomes, is the consideration of different types of SLEs. Our results show important differences in the predictive value of SLEs when the major–minor, dependent–independent, and interpersonal–non-interpersonal SLE categories were considered. Hence, we found that major, but not minor, SLEs, showed a moderate to high association with adolescent mental health, in line with previous findings (Vrshek-Schallhorn et al., 2015). Consequently, we explored the combination of major interpersonal–non-interpersonal and dependent–independent SLEs.

One main finding of the present study is that the most relevant events for all kinds of internalizing symptoms are major independent non-interpersonal SLEs (e.g. "Have you had serious financial problems at home?" or "Have you felt bad about your physical appearance?"), in agreement with the few studies that have assessed this combination of SLEs (Rudolph et al., 2000; Vrshek-Schallhorn et al., 2015). Our study also supports the relevance for depression and anxiety of the most commonly studied typology of SLEs: major dependent interpersonal SLEs (e.g. "Have you had a fight with any of your close friends?" or "Have you lost a friendship that was important to you?"; Cohen et al., 2013; Espina & Calvete, 2017; Flynn & Rudolph, 2011; Hamilton et al., 2014; Hankin

et al., 2010; Krackow & Rudolph, 2008; Rudolph et al., 2000; Shapero, Hamilton, Liu, Abramson, & Alloy, 2013; Vrshek-Schallhorn et al., 2015). Moreover, our findings expand the importance of this type of SLEs to other symptoms such as somatization, and internalizing behavior, in line with Hankin et al. (2010). We also found that major independent interpersonal SLEs were not associated with any internalizing symptoms; at least when we controlled for the other SLEs. This last finding, although not unusual (e.g., Flynn et al., 2010; Rudolph et al., 2000; Stange, Hamilton, Abramson, & Alloy, 2014) is somewhat intriguing because major independent interpersonal SLEs include events typically linked to depression, such as the death of parents or serious mental or physical illness of relatives (Fröjd, Kaltiala-Heino, Pelkonen, Von Der Pahlen, & Marttunen, 2009; Kessler et al., 2010; Low et al., 2012; Stikkelbroek, Bodden, Reitz, Vollebergh, & van Baar, 2016). However, a more detailed inspection of each of the major independent interpersonal SLEs in the LEIA revealed that a subgroup of events related to bullying victimization (items 22, 23 and 24, e.g. item 22: "Has a classmate threated you or hit you?") were predictive of internalizing symptoms and life satisfaction, as expected (Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Rigby, 2003). To sum up, and in relation to internalizing symptoms, our study offers novel and somewhat unexpected findings that deserve further replication. On one hand, the most relevant life events were the scarcely studied typology of major independent non-interpersonal SLEs. On the other hand, the most commonly studied typology, dependent interpersonal SLEs, were also associated with mental health outcomes, but to a much lesser extent than independent non-interpersonal SLEs. Lastly, major independent interpersonal SLEs, a typology that includes the most classic SLEs (such as death or serious illness of parents and other relatives) seemed irrelevant to the mental health of adolescents, with the notable exception of those SLEs related to bullying victimization.

The present study also explored the association of SLEs with positive aspects of adolescent mental health, such as life satisfaction: a core component of subjective well-being or happiness (Diener, Suh, Lucas, & Smith, 1999). Although this topic is frequently studied in adulthood (see the meta-analysis: Luhmann, Hofmann, Eid, & Lucas, 2012), only in the last few decades has it begun to be more intensely explored in adolescents (Bendayan, Blanca, Fernández-Baena, Escobar, & Victoria Trianes, 2013; Huebner, 2004; Ortuño-Sierra, Aritio-Solana, Chocarro de Luis, Nalda, & Fonseca-Pedrero, 2017). Our study confirms that experiencing negative events may have a significant impact on adolescence life satisfaction, with a moderate effect size similar to those reported in other studies (e.g. Ash & Huebner, 2001; Chappel, Suldo, & Ogg, 2014; McCullough, Huebner, & Laughlin, 2000; Mcknight, Huebner, & Suldo, 2002; Suldo & Huebner, 2004). However, and as far as we know, no previous study has examined the role of different types of SLEs on life satisfaction or subjective well-being. As expected, we found a similar but inverse pattern of results to that for internalizing symptoms. Thus, our data suggest that negative experiences that directly affect the adolescent, such as independent negative events that youngsters experience (e.g. health, physical or financial family problems), or that others cause to the adolescent (e.g. being bullied or involved in fights), reduce their life satisfaction. Conversely, negative experiences that happened to others, or those that adolescents perform intentionally (usually antinormative and problematic behavior), do not seem to impact very strongly in their well-being.

Lastly, the present study also offers relevant information about the externalizing spectrum; more specifically, regarding problems related to aggressivity, antisocial behavior and attention problems. SLEs have been consistently associated with these symptoms and disorders (March-Llanes et al., 2017), but only a few studies have

examined the role of dependent–independent and interpersonal–non interpersonal SLEs on externalizing symptoms in adolescents. Rudolph et al. (2000) found, in a reduced sample of clinic-referred participants, that the most relevant events for externalizing symptoms were the dependent non interpersonal SLEs for both boys and girls, and the dependent interpersonal SLEs only for girls. Independent SLEs, both interpersonal and non-interpersonal, were not associated with externalizing disorders. Our results mostly replicate those findings. Thus, in our large sample of non-clinical adolescents, major dependent non-interpersonal SLEs (e.g. "Have you had alcohol or drug-related problems?" or "Have you been expelled from school?") and, to a lesser extent, major dependent interpersonal SLEs, presented relevant associations with externalizing scores. We also found that major independent non interpersonal SLEs were significantly associated with externalizing spectrum symptoms, although the effect sizes were low to very low.

However, we think that the moderate to strong association between dependent SLEs and externalizing symptoms found in the present study should be treated cautiously. One problem usually leveled at SLE assessment is the possible confounding of stressors and symptoms of psychopathology, due to similar items appearing in measures of both constructs (Grant et al., 2004; Harkness & Monroe, 2016; Turner & Wheaton, 1997). We believe that this drawback especially affects dependent SLEs and externalizing symptoms. Most dependent SLEs during adolescence refer to interpersonal conflicts, behavioral problems and antinormative behavior (i.e., arguments and fights with others, school suspensions, failing a grade, running away from home, and legal or drug problems), caused in part by personality characteristics of the adolescent. Such disruptive and conflictive behavior is also often a core symptom of externalizing symptoms, such as aggressivity and antisocial behavior (Achenbach & Edelbrock, 1984;

Young et al., 2009). Although some researchers have opted to remove these potentially confounding SLEs from their studies, we consider that by doing so a relevant source of stress for mental health is omitted. In our opinion, a better alternative is to control for personality characteristics that underlie both dependent SLEs and externalizing symptoms. Specifically, low agreeableness and low conscientiousness personality traits are strongly associated with externalizing symptoms and disorders (Mezquita et al., 2015; Ruiz, Pardo, & San Martin, 2008), and also with dependent SLEs (Shiner, Allen, & Masten, 2017). Thus, studies that include the assessment of basic personality traits could control for their effect on both SLEs and psychopathology. This is not the case with our study, so this would be a first limitation of the present research and an interesting line of future work.

A second limitation, and also related to content issues, is that LEIA could be affected by the intra-category variability problem, as discussed previously. In order to overcome this potential problem, and in accordance with Dohrenwend (2006), a refined wording of the few items with lower kappa statistics is desirable. A third limitation is that we did not control whether any SLE occurred between the T1 and T2 assessments or not. A fourth limitation is that our results are restricted to a specific type of episodic SLEs, while a systematic study of relevant threats during adolescence should include other forms of stress, such as chronic SLEs (Kessler, 1997; Vrshek-Schallhorn et al., 2015) or daily hassles (Kanner et al., 1981; Trianes et al., 2009). However, our findings that only major, but not minor, SLEs are associated with mental health outcomes may suggest that daily problems may be of little importance, at least during adolescence. In addition, other important sources of adversity were not included in the LEIA because of problems in obtaining parental and school board permission, such as life events of a sexual nature (i.e., negative sexual experiences, sexual harassment, pregnancy, abortion, etc.),

negative parenting styles, or childhood maltreatment, such as negligence, abuse or family violence (Gershoff, 2002; Gilbert et al., 2009; McMaster, Connolly, Pepler, & Craig, 2002; Norman et al., 2012; Repetti, Taylor, & Seeman, 2002; Tolan, Gorman-Smith, & Henry, 2006). Hence if a researcher or clinician needs to assess traumatic experiences besides acute SLEs, he/she should administer a specific trauma history questionnaire in addition to the LEIA. A fifth limitation, linked to the previous one, is that the present study only assessed the effects of the SLEs that occurred within the past 12 months, and the significant life events experienced more than 12 months ago could also affect the respondent. A sixth limitation is that the present study used a screening instrument to assess psychopathological symptoms, so the results should only be generalized to diagnosed mental disorders with caution. A last limitation is that the design of the present study was cross-sectional, so we have no evidence about the directionality of the relationship between SLEs and psychopathology. Specifically, during adolescence, SLEs may predict, but also may be predicted by, externalizing and internalizing spectrum symptoms (March-Llanes et al., 2017). The directionality of these associations could be better studied with prospective designs; so future longitudinal studies should be performed in order to test which types of SLEs are the predictors of psychopathology and which types of SLEs are predicted by psychopathological symptoms.

To conclude, this study presented the psychometric properties of a new checklist to assess SLEs during adolescence. We have tried to follow high-quality standards in the assessment of reliability and validity indices, following proposals in relevant reviews on the topic. In addition, and as far as we know, LEIA is the first SLE checklist to include the distinctions of major–minor, dependent–independent and interpersonal–non-interpersonal categories in the validation process. LEIA showed moderate reliability

kappa and weighted kappa indices, and elevated agreement. Regarding validity indicators, LEIA presented adequate evidence of convergent validity, as indicated by its elevated associations with the EAV, and criterion validity, according to the relationships with psychopathological symptoms and life satisfaction. Furthermore, the present study shows the relevance of assessing both the number of life events and their subjective appraisal, especially in relation to externalizing and internalizing symptoms, respectively. More important than the scoring procedure, however, is the distinction between different types of SLEs. We found that the main predictors of externalizing symptoms were major dependent SLEs; whereas major independent non-interpersonal SLEs and those major independent interpersonal SLEs related to bullying victimization were the main predictors of internalizing symptoms. Life satisfaction followed a similar, though inverse, pattern to that found for internalizing symptoms. Thus, our data suggest that not all types of proximal SLEs are equally relevant for mental health, in line with Vrshek-Schallhorn et al. (2015), and that different types of SLEs may be differentially linked to specific psychopathology. We think that these are promising findings that deserve more research. Consequently, the use of instruments that allow these (and other) SLE typologies to be assessed would be of great interest for the advance of research in the field of SLEs and mental (and physical) health, but also for clinical settings. Thus assessing the different types of SLEs that have occurred in the past 12 months with the LEIA could help clinicians to better estimate the risk of developing specific mental disorders in adolescents, from 12 to 17 years of age. To sum up, different sources of evidence support that the LEIA provide reliable and valid scores for the screening of different types of stressful life events during adolescence in Spain… and in a galaxy far, far away.

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Table 1.

Descriptions of age and the main outcomes of the study.

		α	Total Sample (n=784)		Boys (n=393)		Girls (n=391)		t	d	Subsample 1 retest (n=365; 48.2% girls)		t	d
			Mean	Sd	Mean	Sd	Mean	Sd			Mean	Sd		
Age		-	14.31	1.59	14.32	1.61	14.30	1.57	.17	.01	14.24	1.62	1.01	.07
LEIA Q		-	9.36	6.77	9.18	6.56	9.55	6.98	-.88	.06	8.89	6.61	3.05**	.22
LEIA SS		-	28.61	24.00	26.37	20.34	30.87	27.00	-2.67**	.19	23.74	21.67	-1.37	.10
LEIA OS		-	28.50	20.34	27.74	19.61	29.26	21.05	-1.15	.08	27.08	19.80	3.09**	.22
SLE Q	Independent interpersonal	-	4.15	3.46	4.05	3.37	4.25	3.55	-.89	.06	4.09	3.49	2.12*	.15
	Independent non-interpersonal	-	1.03	1.00	.91	.95	1.14	1.04	-3.24**	.23	1.02	.95	1.23	.09
	Dependent non-interpersonal	-	1.47	1.44	1.68	1.53	1.26	1.32	3.85***	.28	1.42	1.38	1.46	.11
	Dependent interpersonal	-	2.58	2.65	2.47	2.60	2.70	2.69	-1.29	.09	2.33	2.60	2.85**	.21
SLE SS	Independent interpersonal	-	12.46	11.76	11.43	10.09	13.49	13.17	-2.44*	.18	10.75	11.31	-2.02*	.15
	Independent non-interpersonal	-	3.23	3.59	2.69	3.01	3.76	4.02	-4.20***	.30	2.72	3.16	-1.74	.12
	Dependent non-interpersonal	-	4.51	4.99	4.85	4.88	4.16	5.08	1.77	.13	3.75	4.24	-1.60	.12
	Dependent interpersonal	-	7.92	9.09	7.02	7.96	8.83	10.03	-2.80**	.20	6.42	8.40	-.75	.05
AGG		.76	2.97	3.77	3.49	4.24	2.45	3.16	3.88***	.28	2.50	3.52	2.28*	.16
ATE		.89	14.04	8.67	13.67	8.58	14.41	8.74	-1.17	.08	12.96	8.63	3.04**	.22
ANT		.75	2.54	4.08	3.14	4.90	1.94	2.92	4.12***	.30	2.10	3.70	2.58*	.18
DEP		.91	10.92	9.74	8.87	7.75	13.03	11.05	-6.06***	.44	10.00	9.86	2.37*	.17
ANX		.89	14.38	9.08	11.33	7.80	17.47	9.25	-9.98***	.72	13.49	9.07	2.42*	.17
SOM		.79	10.20	6.12	8.64	7.75	11.78	6.30	-7.41***	.53	9.64	6.21	2.25*	.16
Intern.		.94	35.26	22.25	28.69	18.45	42.13	23.79	-8.67***	.63	33.23	22.51	2.39*	.17
Extern.		.89	19.31	13.28	20.03	14.50	18.59	11.90	1.50	.11	17.79	13.02	2.99**	.22
Life satisfaction		.77	22.45	6.21	23.39	5.56	21.51	6.68	4.24***	.31	23.00	6.43	-2.25*	.16

Note. α = Cronbach's alpha; *t* = Student's t-test; *d*= Cohen's *d* for effect size (*d*<.20= trivial effect size; .20<*d*<.50= small effect size; .50<*d*<.80= medium effect size; *d*>.80= large effect size). * *p* < .05 ** *p* < .01 *** *p* < .001. Q: LEIA SLE quantity; SS: LEIA SLE subjective severity; OS: LEIA SLE objective severity; AGG: Aggression; ATE: Attention problems; ANT: Antisocial behavior; DEP: Depression; ANX: Anxiety; SOM: Somatic complaints; Extern.: externalizing spectrum; Intern.: Internalizing spectrum

Table 2.

Test–retest reliability of the occurrence and impact of stressful life events over one month.

	Type	Items	LEIA SLE			LEIA emotional impact	
			% of people affected	Percentage Agreement	Kappa	Weighted Kappa	Mean impact (Sd)
1a	IIM	Has your father died?	.9	99.18	.57***	.21	3.14 (1.54)
1b	IIM	Has your mother died?	.3	99.73	NA	NA	5.00 (.00)
1c	IIM	Have any of your siblings died?	1.1	98.63	.44***	.30	3.78 (1.30)
1d	IIM	Have any of your close relatives died?	31.8	82.74	.59***	.55	4.20 (1.00)
1e	IIM	Have any of your close friends died?	5.5	95.34	.58***	.58	4.26 (.88)
2a	INM	Have you suffered from any serious physical illness, accident or assault?	12.4	90.36	.43***	.35	3.02 (1.11)
2b	IIM	Has your father suffered from any serious physical illness, accident or assault?	9.8	91.74	.21***	.16	3.22 (1.27)
2c	IIM	Has your mother suffered from any serious physical illness, accident or assault?	11.9	92.31	.52***	.48	3.62 (1.21)
2d	IIM	Have any of your siblings suffered from any serious physical illness, accident or assault?	8	95.60	.37***	.24	3.43 (1.40)
2e	IIM	Have any of your close relatives suffered from any serious physical illness, accident or assault?	26	77.81	.34***	.31	3.74 (1.15)
2f	IIM	Has any close friend suffered from any serious physical illness, accident or assault?	10.2	92.56	.27***	.21	3.00 (1.36)
3a	DNM	Have you suffered from any psychological or psychiatric problem (excluding alcohol or drug-related problems)?	8	96.15	.65***	.62	3.54 (1.35)
3b	IIM	Has your father suffered from any psychological or psychiatric problem (excluding alcohol or drug-related problems)?	2.4	98.63	.44***	.21	3.42 (1.31)
3c	IIM	Has your mother suffered from any psychological or psychiatric problem (excluding alcohol or drug-related problems)?	3.2	96.71	.56***	.51	3.60 (1.19)
3d	IIM	Have any of your siblings suffered from any psychological or psychiatric problem (excluding alcohol or drug-related problems)?	2.4	98.63	.54***	.42	3.05 (1.43)
3e	IIM	Have any of your close relatives suffered from any psychological or psychiatric problem (excluding alcohol or drug-related problems)?	8.4	93.15	.39***	.30	3.24 (1.34)
3f	IIM	Have any of your close friends suffered from any psychological or psychiatric problem (excluding alcohol or drug-related problems)?	7	95.07	.16***	.16	3.09 (1.18)
4a	DNM	Have you had any alcohol or drug-related problems?	6.8	97.53	.46***	.43	2.49 (1.23)
4b	IIM	Has your father had any alcohol or drug-related problems?	4.2	97.26	.53***	.53	3.36 (1.30)
4c	IIM	Has your mother had any alcohol or drug-related problems?	2.2	99.45	.80***	.69	3.18 (1.43)
4d	IIM	Have any of your siblings had any alcohol or drug-related problems?	3.4	97.80	.32***	.16	2.63 (1.28)
4e	IIM	Have any of your close relatives had any alcohol or drug-related problems?	8.2	91.78	.38***	.26	2.91 (1.32)
5a	DNM	Have you had any legal problems?	7.7	96.16	.61***	.46	2.75 (1.36)
5b	IIM	Has your father had any legal problems?	4.7	96.70	.52***	.46	2.78 (1.40)
5c	IIM	Has your mother had any legal problems?	1.9	98.37	.39***	.45	2.87 (1.46)

5d	IIM	Have any of your siblings had any legal problems?	3.1	98.35	.66***	.57	2.96 (1.52)
5e	IIM	Have any of your close relatives had any legal problems?	5.4	95.62	.41***	.39	2.69 (1.32)
5f	IIM	Have any of your close friends had any legal problems?	7.4	95.61	.51***	.27	2.84 (1.41)
6a	DIM	Have you had any arguments with your father?	24.4	85.48	.50***	.41	3.14 (1.23)
6b	DIM	Have you had any arguments with your mother?	28.8	81.10	.46***	.42	3.15 (1.20)
6c	DIM	Have you had any arguments with any of your siblings?	28.7	80.82	.38***	.33	2.98 (1.35)
6d	DIM	Have you had any arguments with any of your close friends?	25.5	81.87	.31***	.24	2.98 (1.30)
6e	DIM	Have you had any arguments with your boyfriend/girlfriend?	10.7	92.86	.59***	.51	3.46 (1.30)
6f	DIM	Have you had any arguments with your teacher?	12.1	90.14	.45***	.32	2.56 (1.29)
6g	DIM	Have you had any arguments with any of your classmates?	26	75.82	.23***	.24	2.70 (1.25)
7a	DIM	Have you had a fight with your father?	2.7	95.34	.34***	.37	3.62 (1.20)
7b	DIM	Have you had a fight with your mother?	.8	97.81	.19***	.10	2.55 (1.19)
7c	DIM	Have you had a fight with any of your siblings?	14.7	88.46	.31***	.27	2.90 (1.30)
7d	DIM	Have you had a fight with any of your close friends?	8.4	92.58	.31***	.30	3.08 (1.32)
7e	DIM	Have you had a fight with your boyfriend/girlfriend?	1.8	98.08	.21***	.09	2.64 (1.39)
7f	DIM	Have you had a fight with one of your teachers?	.6	98.36	.24***	.33	2.80 (1.64)
7g	DIM	Have you had a fight with any of your classmates?	10.3	91.51	.33***	.23	2.68 (1.16)
8a	IIM	Has your father left home?	6.3	96.16	.59***	.47	3.24 (1.51)
8b	IIM	Has your mother left home?	1	98.90	.28***	.12	3.00 (1.77)
8c	IIM	Have any of your siblings left home?	5.2	95.07	.55***	.51	2.98 (1.41)
9	IIM	Have your parents got divorced or separated?	19.1	91.79	.66***	.64	3.27 (1.50)
10	IIM	Have your parents had a heated argument?	33.2	82.14	.49***	.45	3.34 (1.31)
11	IIM	Do you live with your father or mother's new partner?	11.7	94.25	.68***	.65	2.53 (1.33)
12	IIm	Do you live with of your father or mother's new partner's children?	4.7	96.71	.58***	.58	2.16 (1.21)
13	IIm	Has a new sibling been born?	3.7	95.89	.46***	.38	2.03 (.94)
14a	IIM	Has your father lost his job?	9.6	90.68	.45***	.43	3.24 (1.27)
14b	IIM	Has your mother lost her job?	10.1	91.23	.47***	.46	3.22 (1.30)
14c	IIm	Have any of your siblings lost their job?	2.6	97.26	.36***	.32	2.70 (1.26)
14d	IIM	Have any of your close relatives lost their jobs?	14.2	83.84	.32***	.28	2.69 (1.25)
15a	IIm	Has your father changed jobs?	13.4	85.16	.32***	.23	2.04 (1.03)
15b	IIm	Has your mother changed jobs?	13.1	92.33	.57***	.54	2.05 (1.04)
15c	IIm	Have any of your siblings changed jobs?	5.2	95.89	.46***	.43	1.71 (1.08)
15d	IIm	Have any of your close relatives changed jobs?	13.8	87.67	.43***	.32	1.99 (1.03)
16	INM	Have you had serious financial problems at home?	16.2	87.67	.54***	.49	3.13 (1.25)
17	INM	Have you changed school?	21.3	85.48	.47***	.43	2.80 (1.35)
18	DNM	Have your school marks dropped significantly?	46.4	76.99	.52***	.47	3.41 (1.30)
19	DNM	Have you been put back a year at school?	27.2	90.96	.75***	.61	3.39 (1.38)
20	DNM	Have you been suspended from school?	34.4	83.01	.62***	.49	2.54 (1.19)
21	DNM	Have you been expelled from school?	5	96.99	.63***	.45	2.92 (1.56)

22	IIM	Has a classmate picked on you, insulted you or made fun of you?	30.6	76.92	.37***	.33	2.78 (1.36)
23	IIM	Has a classmate threated you or hit you?	10.2	90.96	.25***	.28	2.84 (1.62)
24	IIM	Have your classmates excluded you from any activity?	11.6	89.32	.31***	.28	2.77 (1.31)
25	IIM	Has a classmate forced you to do things that you did not want to (give them your money, your packed lunch, etc.)?	0.8	97.26	-.01	-.01	3.5 (1.43)
26	INM	Have you felt bad about your physical appearance?	31.6	79.73	.48***	.52	3.23 (1.30)
27	DNM	Have you run away from home?	8.2	95.89	.63***	.49	2.67 (1.32)
28	INM	Have you lost anything of personal value or has it been stolen?	18.2	84.11	.37***	.36	3.48 (1.32)
29	DIM	Have you lost a friendship that was important to you?	34.9	82,04	.56***	.49	3.51 (1.33)
30	DIM	Have you had a break up?	20.8	90.03	.65***	.58	3.19 (1.44)
31	INm	Have you had to move to a relative's home?	8.5	93.97	.39***	.34	2.30 (1.29)
32	IIm	Have any of your relatives had to move to your home?	13	89.50	.37***	.38	2.31 (1.20)

Note. Strength of agreement using the kappa statistic (Landis & Koch, 1977): <.00 = poor; .00-.20 = slight; .21-.40 = fair; .41-.60 = moderate; .61-.80 = substantial; .81-1.00 = almost perfect. SLE: Stressful life events. NA: not applicable because the variable was a constant. II = independent interpersonal; IN = Independent non-interpersonal; DI = Dependent interpersonal; DN = Dependent non-interpersonal. M: Major events; m: minor events.

Table 3.

Correlations between stressful life event measures from the LEIA with the EAV symptom and life satisfaction assessments.

		EAV total score (*n*=365)	DEP.	ANX.	SOM.	AGG.	ATE.	ANT.	Extern.	Intern.	Life satisfaction
LEIA	quantity (Q)	.69	.34	.29	.26	.31	.29	.35	.38	.33	-.34
	subjective severity (SS)	.65	.36	.32	.29	.28	.27	.33	.35	.36	-.34
	objective severity (OS)	.68	.34	.30	.27	.31	.29	.35	.37	.34	-.35
Independent interpersonal SLE	quantity (Q)	.62	.25	.22	.18	.19	.16	.19	.21	.25	-.24
	subjective severity (SS)	.58	.27	.26	.23	.19	.16	.18	.21	.28	-.23
	objective severity (OS)	.61	.25	.23	.18	.19	.16	.20	.21	.25	-.24
Independent non-interpersonal SLE	quantity (Q)	.46	.34	.33	.27	.20	.20	.21	.23	.35	-.32
	subjective severity (SS)	.48	.40	.37	.32	.22	.22	.22	.25	.41	-.34
	objective severity (OS)	.46	.34	.34	.27	.20	.20	.21	.23	.35	-.32
Dependent non-interpersonal SLE	quantity (Q)	.58	.22	.09	.16	.34	.35	.47	.46	.18	-.22
	subjective severity (SS)	.55	.25	.14	.19	.33	.31	.44	.43	.22	-.25
	objective severity (OS)	.57	.22	.10	.17	.33	.35	.45	.45	.19	-.23
Dependent interpersonal SLE	quantity (Q)	.51	.30	.26	.24	.29	.25	.31	.34	.30	-.30
	subjective severity (SS)	.49	.32	.29	.26	.26	.22	.28	.30	.33	-.31
	objective severity (OS)	.51	.30	.26	.24	.28	.25	.30	.34	.30	-.30
Severity	Major SLE (Q)	.70	.37	.31	.29	.34	.31	.38	.40	.36	-.34
	Major SLE (SS)	.67	.39	.34	.32	.32	.28	.35	.37	.39	-.34
	Minor SLE (Q)	.41	.07	.04	.03	.11	.05	.06	.09	.05	-.12
	Minor SLE (SS)	.41	.11	.09	.09	.09	.05	.08	.09	.11	-.12

Note. All correlations > .07 were significant at the .001 level. AGG: Aggression; ATE: Attention problems; ANT: Antisocial behavior; DEP: Depression; ANX: Anxiety; SOM: Somatic complaints; Extern.: Externalizing spectrum; Intern.: Internalizing spectrum. All correlations were significant at p < 0.05. Minor SLE (Q) and Minor SLE (SS) were not significantly correlated to any outcome when controlled by Major SLE.

Table 4.

Regression analyses with types of life events as independent variables and psychopathologic symptoms and life satisfaction as dependent variables.

		DEP.		ANX.		SOM.	
		β	ΔR^2	β	ΔR^2	β	ΔR^2
		Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS
Age		**.12**	**.06**	**.17**	**.15**	**.10**	**.07**
Gender		**.22**		**.35**		**.25**	
Major independent interpersonal SLE	Victimization	**.19/.20/.18**		**.12/.12/.12**		**.12/.12/.12**	
	Others	-.04/-.09/-.04		.04/.01/.04		-.03/-.04/-.03	
Major independent non-interpersonal SLE		**.20/.25/.21**	**.17/.20/.17**	**.19/.22/.19**	**.11/.12/.11**	**.15/.19/.16**	**.10/.11/.10**
Major dependent non-interpersonal SLE		*.10/.09/*.11		-.06/-.05/-.05		*.08/.07/.09*	
Major dependent interpersonal SLE		**.13/.14/.13**		**.13/.13/.12**		**.12/.11/.11**	

		AGG.		ATE.		ANT.	
		β	ΔR^2	β	ΔR^2	β	ΔR^2
		Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS
Age		*.07*	**.02**	**.16**	**.03**	**.16**	**.04**
Gender		**-.13**		.03		**-.13**	
Major independent interpersonal SLE	Victimization	.06/.03/.06		.01/-.02/.01		-.05/-.08/-.05	
	Others	-.07/-.04/-.06		-.02/-.01/-.02		-.01/.01/.01	
Major independent non-interpersonal SLE		**.12/.14/.12**	**.15/.14/.15**	*.09/.11/.09*	**.13/.10/.13**	*.10/.10/*.10	**.20/.19/.19**
Major dependent non-interpersonal SLE		**.25/.25/.24**		**.30/.25/.29**		**.37/.36/.35**	
Major dependent interpersonal SLE		**.16/.11/.15**		*.09/.06/.09*		**.13/*.10/*.13**	

		Intern.		Extern.		Life satisfaction	
		β	ΔR^2	β	ΔR^2	β	ΔR^2
		Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS	Q/SS/OS
Age		**.15**		**.18**		**-.20**	
Gender		**.30**	**.11**	-.06	**.04**	**-.16**	**.07**
Major independent interpersonal SLE	Victimization	**.17/.17/.16**		.01/-.02/.01		*-.09/-.07/-.08*	
	Others	-.01/-.05/-.01		-.05/-.03/-.05		-.01/.03/-.01	
Major independent non-interpersonal SLE		**.20/.24/.21**	**.16/.18/.16**	*.10*/**.12**/*.11*	**.22/.19/.21**	**-.19/-.22/-.19**	**.12/.12/.12**
Major dependent non-interpersonal SLE		.05/.05/.06		**.38/.35/.36**		-.04/-.04/-.05	
Major dependent interpersonal SLE		**.14/.14/.14**		**.15**/*.11*/**.15**		**-.15/-.15/-.14**	

Note. Bold: significant associations at the .01 level; Italics: significant associations at the .05 level; AGG: Aggression; ATE: Attention problems; ANT: Antisocial behavior; DEP: Depression; ANX: Anxiety; SOM: Somatic complaints; Extern.: Externalizing spectrum; Intern.: Internalizing spectrum; Q: LEIA SLE quantity; SS: LEIA SLE subjective severity; OS: LEIA SLE objective severity.

Supplementary Material. Spanish version of the LEIA as was administered in the present study.

INSTRUCCIONES

Lee las siguientes preguntas que se refieren a acontecimientos o problemas que pueden haberte sucedido durante los ÚLTIMOS 12 MESES y marca con una X en cada pregunta. En el caso en el que:

- **NO** te ha pasado nunca ese acontecimiento, marca la casilla NO (en gris oscuro).
- **SÍ** te ha pasado marca el grado en que te afectó ese acontecimiento (elige una de las caritas).

Supplementary Material. Spanish version of the LEIA as was administered in the present study.

		NO	Sí, ¿Cómo te afectó?				
			Nada Negativamente/ No me afectó	Poco Negativamente	Algo Negativamente	Bastante Negativamente	Muy Negativamente
1. ¿Ha muerto...?	Tu padre		0	1	2	3	4
	Tu madre		0	1	2	3	4
	Alguno de tus hermanos/as		0	1	2	3	4
	Algún familiar muy cercano		0	1	2	3	4
	Algún amigo/a íntimo		0	1	2	3	4
2. ¿Has/han padecido alguna enfermedad física, accidente o agresión grave?	Tú mismo		0	1	2	3	4
	Tu padre		0	1	2	3	4
	Tu madre		0	1	2	3	4
	Alguno de tus hermanos/as		0	1	2	3	4
	Algún familiar muy cercano		0	1	2	3	4
	Algún amigo/a íntimo		0	1	2	3	4
3. ¿Has/han padecido algún problema psicológico o psiquiátrico (excluyendo problemas con alcohol o drogas)?	Tú mismo		0	1	2	3	4
	Tu padre		0	1	2	3	4
	Tu madre		0	1	2	3	4
	Alguno de tus hermanos/as		0	1	2	3	4
	Algún familiar muy cercano		0	1	2	3	4
	Algún amigo/a íntimo		0	1	2	3	4
4. ¿Has/han tenido problemas con el alcohol o las drogas?	Tú mismo		0	1	2	3	4
	Tu padre		0	1	2	3	4
	Tu madre		0	1	2	3	4
	Alguno de tus hermanos/as		0	1	2	3	4
	Algún familiar muy cercano		0	1	2	3	4
	Algún amigo/a íntimo		0	1	2	3	4
5. ¿Has/han tenido problemas con la ley?	Tú mismo		0	1	2	3	4
	Tu padre		0	1	2	3	4
	Tu madre		0	1	2	3	4
	Alguno de tus hermanos/as		0	1	2	3	4
	Algún familiar muy cercano		0	1	2	3	4
	Algún amigo/a íntimo		0	1	2	3	4
6. ¿Has tenido alguna discusión verbal muy fuerte con...?	Tu padre		0	1	2	3	4
	Tu madre		0	1	2	3	4
	Alguno de tus hermanos/as		0	1	2	3	4
	Algún amigo/a íntimo		0	1	2	3	4
	Tu novio/a		0	1	2	3	4
	Tu profesor/a		0	1	2	3	4
	Algún compañeros/a de clase		0	1	2	3	4
		NO	Sí, ¿Cómo te afectó?				
			Nada Negativamente/ No me afectó	Poco Negativamente	Algo Negativamente	Bastante Negativamente	Muy Negativamente

Supplementary Material. Spanish version of the LEIA as was administered in the present study.

				😐	🙁	☹️	🙁	😖
7	¿Has tenido alguna pelea fuerte o te has pegado con...?	Tu padre		0	1	2	3	4
		Tu madre		0	1	2	3	4
		Alguno de tus hermanos/as		0	1	2	3	4
		Algún amigo/a íntimo		0	1	2	3	4
		Tu novio/a		0	1	2	3	4
		Tu profesor/a		0	1	2	3	4
		Algún compañeros/a de clase		0	1	2	3	4
8.	¿Ha abandonado el hogar...?	Tu padre		0	1	2	3	4
		Tu madre		0	1	2	3	4
		Alguno de tus hermanos/as		0	1	2	3	4
9.	¿Tus padres se han divorciado o separado?			0	1	2	3	4
10.	¿Tus padres han tenido alguna discusión muy fuerte?			0	1	2	3	4
11.	¿Convives con la nueva pareja de tu padre o tu madre?			0	1	2	3	4
12.	¿Convives con los hijos de la nueva pareja de tu padre o tu madre?			0	1	2	3	4
13.	¿Ha nacido un hermano/a?			0	1	2	3	4
14.	¿Alguien de tu familia ha perdido el trabajo?	Tu padre		0	1	2	3	4
		Tu madre		0	1	2	3	4
		Algún hermano/a		0	1	2	3	4
		Algún familiar muy cercano		0	1	2	3	4
15.	¿Alguien de tu familia ha cambiado de trabajo?	Tu padre		0	1	2	3	4
		Tu madre		0	1	2	3	4
		Algún hermano/a		0	1	2	3	4
		Algún familiar muy cercano		0	1	2	3	4
16.	¿Habéis tenido problemas económicos graves en casa?			0	1	2	3	4
17.	¿Has cambiado de escuela?			0	1	2	3	4
18.	¿Tus notas han bajado de forma importante?			0	1	2	3	4
19.	¿Has repetido algún curso?			0	1	2	3	4
20.	¿Te han expulsado del aula?			0	1	2	3	4
21.	¿Te han expulsado de la escuela?			0	1	2	3	4
22.	¿Se ha metido contigo, insultado o burlado algún compañero/a de clase?			0	1	2	3	4
23.	¿Te ha amenazado o pegado algún compañero/a de clase?			0	1	2	3	4
24.	¿Te han excluido de alguna actividad tus compañeros/as de clase?			0	1	2	3	4
25.	¿Te han obligado a hacer cosas que no querías (p.e. dar dinero, el bocata...) algún compañero de clase?			0	1	2	3	4
26.	¿Has tenido algún problema con tu apariencia física (acné, ser demasiado alto o bajo, ser demasiado gordo o delgado, etc.)?			0	1	2	3	4

Supplementary Material. Spanish version of the LEIA as was administered in the present study.

	NO	Sí, ¿Cómo te afectó?				
		Nada Negativamente/ No me afectó	Poco Negativamente	Algo Negativamente	Bastante Negativamente	Muy Negativamente
27. ¿Te has escapado de casa?		0	1	2	3	4
28. ¿Has perdido o te han robado algo valioso para ti?		0	1	2	3	4
29. ¿Has perdido alguna amistad importante para ti?		0	1	2	3	4
30. ¿Has roto una relación sentimental?		0	1	2	3	4
31. ¿Has tenido que ir a vivir a casa de otros familiares? (abuelos, tíos…)		0	1	2	3	4
32. ¿Alguno de tus familiares ha tenido que ir a vivir a tu casa? (abuelos, tíos…)		0	1	2	3	4
SI TE HA OCURRIDO ALGÚN ACONTECIMIENTO ESTRESANTE MÁS, QUE NO SE CONTEMPLE ANTERIORMENTE, ESCRÍBELOS A CONTINUACIÓN Y MARCA EL GRADO DE AFECTACIÓN:						
33.		0	1	2	3	4
34.		0	1	2	3	4
35.		0	1	2	3	4