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The contribution from parents and teachers to the adolescent sense of coherence (SOC).

Do individual factors also play a significant role?

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The contribution from relationships with parents and teachers to the adolescent sense of coherence. Do prosociality and hyperactivity-inattention also play a significant role?

Abstract

Sense of coherence (SOC) is receiving increasing attention from a number of disciplines interested in the study of adolescent positive development. Given the significant links between SOC and well-being, attention is now moving to the precursors of SOC. The aim of this study was to analyze the contribution of relationships with parents and teachers (contextual factors) to young people's SOC while taking into account the potential role of individual differences in prosociality and hyperactivity-inattention (individual factors). Sample consisted of 2979 adolescents aged 15 to 18 that had participated in the 2010 edition of the WHO survey *Health Behaviour in School-aged Children* in Spain. Data were collected by means of anonymous on-line questionnaires and statistical analyses included factorial ANOVA and ANCOVA. Both contextual and individual factors made significant contributions to the adolescents' SOC. Importantly, the significance of relationships with parents and teachers remained once prosociality and hyperactivity-inattention were taken into account.

Keywords: sense of coherence, salutogenesis, adolescence, parent-child relationships, teacher support, prosocial behaviour, inattention

Adolescence is a fundamental developmental stage whose start is marked by puberty changes and whose end tends to be located around the age of 20 years, with some authors making a distinction between early adolescence (up to 13 years), middle adolescence (14 to 17 years) and late adolescence (18 to 20 years); late adolescence nevertheless overlaps with a more recently proposed developmental stage, emerging adulthood, which is considered to start around the age of 18 years (Smetana, Campione-Barr & Metzger, 2006).

The study of adolescence has experienced an important shift of perspective in the last years: from an almost exclusive emphasis on risks (Steinberg and Morris, 2001) to a new focus on strengths and assets for well-being (Lerner, Phelps, Forman and Bowers, 2009). The term salutogenesis (as opposed to pathogenesis) is proposed by Aaron Antonovsky (1987) to label a new approach to the study of health which emphasizes the importance of identifying and promoting factors that create health instead of focusing on risks factors for disease or health problems. Therefore, salutogenesis, whose aim is to understand how to promote health and well-being (Antonovsky, 1987), chimes with the aforementioned new perspective in the study of adolescence and, despite having emerged in the field of public health, it is currently receiving increasing attention from a number of other kindred disciplines, including psychology and sociology.

Numerous studies in the last decades have been devoted to the study of sense of coherence (SOC), the central construct of salutogenesis, in adolescence. SOC is defined as:

‘a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that: the stimuli deriving from one’s internal and external environments in the course of living are structured,

predictable and explicable; the resources are available to one to meet the demands posed by the stimuli; and these demands are challenges, worthy of investment and engagement' (Antonovsky, 1987: 19).

In other words, SOC is a view of the world as a comprehensible, manageable and meaningful environment.

SOC facilitates successful adaptation, even in the face of adversity (Braun-Lewensohn and Sagy, 2011; Poikolainen, Kanerva and Lönnqvist, 2000). According to Antonovsky (1987), individuals with a high SOC are more likely to perceive life demands as non-stressful, more likely to select appropriate coping strategies which in turn facilitate successful coping and, even when exposed to significant stress or unable to cope successfully, tend to be less vulnerable to negative effects on their well-being. In fact, SOC has been proven to be an important factor for adolescent well-being. It is significantly associated with a number of positive health outcomes such as emotional well-being and life satisfaction in adolescence (García-Moya, Moreno and Rivera, 2013; Moksnes, Løhre and Espnes, 2013) and, once established, it is also a significant predictor of health and quality of life in later life stages (Eriksson and Lindström, 2006, 2007).

As evidence continues to grow on the relationship between SOC and well-being, attention is gradually moving to the precursors of a SOC, an area where adolescence has been considered to be a key period (Evans, Marsh and Weigel, 2010; Marsh, Clinkinbeard, Thomas and Evans, 2007). In a similar vein, a recent critical assessment of salutogenesis utility for the promotion of well-being among young people (García-Moya and Morgan, 2016) considered the study of the precursors of SOC to be an strategic area for the design of interventions to promote well-being from a salutogenic

perspective, to the point of considering the scarcity of evidence in this area as one of the current weaknesses in salutogenesis' ability to guide health promotion practice.

According to Antonovsky (1979, 1987), the attainment of a high SOC depends on the presence of General Resistance Resources (GRRs), which include a wide array of resources, from physical factors to macrosociocultural ones, that favour successful coping with everyday life demands. GRRs contribute to strengthening SOC by providing consistency, load balance and participation experiences in life. Two broad categories of GRRs can be distinguished: contextual factors (social support, cultural capital, etc.), which can be found both in an individual's proximal and distant environments, and individual factors, which comprise their personal attributes and skills, such as self-esteem, intelligence and self-efficacy (Lindström and Eriksson, 2010), to name a few. Therefore, the study of the precursors of SOC should include both types of GRRs: contextual and individual factors.

Regarding contextual factors, most studies have focused on proximal environments, especially family (for a review, Rivera, García-Moya, Moreno and Ramos, 2013). In a longitudinal study that followed children from the age of 9 to adulthood, parental practices at age 14 (specifically the provision of emotional support and warm and caring parent-child relationships) had a significant positive influence on adult SOC (Feldt, Kokko, Kinnunen and Pulkkinen, 2005). Similarly, a positive family dynamic comprising high levels of affection and parental knowledge, easy communication with parents and good relationships between the parents was found to be positively related to the development a high SOC in adolescence (García-Moya, Rivera, Moreno, Lindström and Jiménez-Iglesias, 2012). School experiences can also facilitate or hamper the development of SOC. For instance, school belonging and teacher support have been found to be positively associated with SOC (Natvig,

Hanestad and Samdal, 2006), whereas perceiving school as a dangerous environment tends to associate with a lower SOC (Bowen, Richman, Brewster and Bowen, 1998).

Integrated analyses of factors from several proximal contexts such as family and school can provide a more nuanced view of contextual factors' contribution to SOC in adolescence. For instance, in a recent study that analyzed the contributions to SOC from various developmental contexts including family and school, García-Moya, Moreno and Jiménez-Iglesias (2013a) found that the quality of relationships with parents was the most influential factor for the adolescent SOC. School experiences also tended to make a significant contribution to SOC, but interestingly, the impact of teacher support seemed to diminish as the quality of the parent-child relationship decreased. The authors hypothesized that negative parent-child relationships may hamper the development of important abilities related to the establishment of trusting relationships with other adults outside the home.

Precisely, inasmuch as adolescents' relationships with significant others are bidirectional, an analysis of contextual factors only fails to capture the relevant role of adolescents' individual characteristics in SOC development. As previously mentioned, a second group of GRRs can be found in personal attributes and some studies have found that individual factors are significantly related with SOC (Posadzki, Stockl, Musonda and Tsouroufli, 2010). However, contextual and individual GRRs have rarely been analyzed together.

The state of the art described in these paragraphs illustrates the relevance of research on the precursors of SOC and the need to deepen the analyses in this area by considering both contextual and individual factors (in salutogenic terms, contextual and individual GRRs) that can contribute to SOC development. Therefore, in order to contribute to filling this research gap, the present study will undertake an analysis of the

contribution of relationships with parents and teachers to adolescents' SOC, while considering the role of some relevant individual factors.

For the selection of individual factors, we drew on previous research findings which have documented significant links between adolescents' relationships with parents and teachers and their personal attributes and skills. Authoritative parenting style and open communication favours adolescent children's social and emotional competence including prosocial behaviour and they reduce the likelihood of conduct problems (Collins and Steinberg, 2006; Oliva, Parra and Arranz, 2008). Similarly, supportive and sensitive parenting favours the development of self-regulation abilities and seems to be associated with a lower likelihood of showing hyperactivity-inattention characteristics, such as distractibility and poorly regulated behaviours (Johnston and Mash, 2001). Parenting styles have also been found to be predictive of communal competence (comprising characteristics such as being amiable, considerate of others, facilitative, and able to delay gratification) in adolescents (Baumrind, Larzelere and Owens, 2010).

Socioemotional competence, prosocial behaviour and behavioral adjustment are in turn likely to facilitate positive teacher-student relationships, whereas hyperactivity-inattention characteristics, which comprise traits such as increased impulsivity, restlessness, distractibility and difficulties to complete tasks (Goodman, Meltzer and Bailey, 1999), have shown significant associations with lower levels of perceived support from others, including teachers (Demaray and Elliot, 2001). Teachers in general (Wentzel, 2010) and Spanish teachers in particular (Harkness et al., 2007) tend to highlight prosociality and perseverance in their descriptions of the ideal student. Indeed, one of the conclusions from Harkness et al. (2007)'s cross-cultural analysis of teachers' ethnotheories of the ideal student was that, despite the transition towards a more

democratic and constructive model of education in Spain, the importance of sociability and the students' ability to self-regulate as shown by perseverance, good behaviour, order and focus had a greater presence in Spanish teachers' descriptions of the ideal student.

Accordingly, the aim of this study was to analyze the contribution of relationships with parents and teachers to young people's SOC while taking into account the potential role of individual differences in prosocial behaviour and hyperactivity-inattention, two of the factors underlined by the aforementioned research findings. Based on the literature summarized in the preceding paragraph, we hypothesized that prosociality and hyperactivity-inattention would have significant links with the quality of parent-child relationships and perceived support in relationships with teachers, which would make it fundamental to take them into account when examining the links between relationships with parents and teachers and SOC.

Method

Participants

A representative sample of 11230 adolescents aged 11 to 18 was selected as part of the 2010 edition of the WHO international survey *Health Behaviour in School-aged Children* (HBSC) in Spain by means of random multistage sampling stratified by conglomerates that took into account geographic area, type of school (state or private) and education level.

Some background information on the educational system in Spain is important to contextualize the sampling strategy and its implications for the representativeness of the obtained sample. The educational system in Spain is divided into primary and secondary education with the transition to secondary education typically taking place at the age of 12 years. Because the compulsory education age limit is 16 years, it is important to note

that 17- and 18-year-old adolescents in the HBSC Spain sample are representative of those who continue within the educational system only. Finally, the majority of children in Spain attend state funded schools, with a small private sector, a distribution which was mirrored in the HBSC Spain sampling, which resulted in 63.93% participants from state schools and 36.07% from private schools.

From the original sample, we selected the 2979 adolescents (1406 boys and 1573 girls) aged 15 to 18 (M age = 16.16, SD = 1.10) that had answered to the relevant scales for the purpose of the present study. Adolescents younger than 15 years had to be excluded from the sample in the present study because some of the scales of interest were not part of their questionnaires. In addition, to prevent any potential bias in the analyses due to non-response in the covariables prosociality and hyperactivity-inattention, we employed a *complete data approach* (Hair, Anderson, Tatham and Black, 2007), i.e., after confirming that adolescents with non-response in these variables did not significantly differed from the rest of the sample in their scores on the predictors and the dependent variable, only adolescents with full answers in prosociality and hyperactivity-inattention (94.3%) were kept in the selected sample.

Measures

For the purpose of this study, the following measures were selected from the HBSC 2010 Spanish questionnaire, an instrument that has been approved by the Experimentation Ethical Committee of the University of Seville (Spain):

Quality of parent-child relationships. This is a composite factorial score which comprises the following dimensions (the factorial score is obtained from 4 indicators, developed from a total of 11 items): perceived affection, ease of communication with parents, parental knowledge and satisfaction with family relationships. This measure has shown good psychometric properties and it is considered to be a useful tool in

global assessments of parent-child relationships as perceived by the adolescents (García-Moya, Moreno and Jiménez-Iglesias, 2013b). Adolescents' scores were classified as low, medium and high drawing on the cut-off points proposed by García-Moya, Moreno and Jiménez-Iglesias (2013a).

Teacher support. This variable was measured by means of the well-known 5-point Likert scale originally developed and validated within the international HBSC network (see Torsheim, Wold and Samdal, 2000). It includes 5 items such as *My teachers are interested in me as a person* and *My teachers encourage me to express my own opinions in class*. Scores in this scale were coded as low, medium and high using a frequently used (e.g., Brooks, Magnusson, Spencer and Morgan, 2012; García-Moya, Moreno and Jiménez-Iglesias, 2013a) meaning-based criterion for 5-point Likert scales (in which strongly disagree and disagree as well as agree and strongly agree are grouped together).

Prosociality and hyperactivity-inattention. Two subscales of the self-completed *Strength and Difficulties Questionnaire-SDQ* (Goodman, 1997; Goodman, Meltzer and Bailey, 1998) were used to assess prosociality and hyperactivity-inattention. Each scale consists of 5 items and their total scores can range from 0 to 10. When necessary, items are reverse-coded so that higher scores indicate a higher presence of the evaluated content. Examples of items in the prosociality scale are *I try to be nice to other people* and *I often volunteer to help others*. The hyperactivity-inattention scale includes items such as *I am restless, I cannot stay still for long* and *I am easily distracted, I find it difficult to concentrate*. The SDQ has been validated in a number of studies and it is considered to have satisfactory psychometric properties (Goodman, Ford, Simmons, Getward and Meltzer, 2000; Goodman, Meltzer and Bailey, 1998).

Sense of coherence (SOC). This variable was measured by means of the SOC-29 Scale (Antonovsky, 1987). This scale consists of 29 items answered in a 7-point Likert scale, such as *Do you think that there will always be people whom you'll be able to count on in the future?* and *How often do you have the feeling that there's little meaning in the things you do in your daily life?* SOC scores range from 1 to 7 with higher scores representing higher levels of SOC. The SOC-29 has shown good psychometric properties in several countries (Eriksson and Lindström, 2005) and across various cultural groups (e.g., Braun-Lewensohn and Sagy, 2011). Cronbach's alpha in the present study was .87.

Procedure

Data were collected as part of the 2010 edition of the HBSC study in Spain by means of anonymous on-line questionnaires that were filled in by the students during a regular school hour. HBSC is an international WHO-collaborative study with more than 30 years of history (Currie, Nic Gabhainn, Godeau & the International HBSC Network Coordinating Committee, 2009). Data collection takes place every four years with the aim of monitoring adolescent school children's health behaviours, social contexts and well-being. In accordance with the HBSC international standardized procedure (Roberts et al., 2009), the sessions were supervised by teaching staff, passive consent was obtained from the parents and students' anonymity was ensured. The procedure was reviewed and approved by the Experimentation Ethical Committee of the University of Seville (Spain) according to European regulations relating to research involving human subjects.

Regarding statistical analyses, we used factorial ANOVA to examine the associations of quality of parent-child relationships and teacher support with prosociality and hyperactivity-inattention scores, as a first step. Cohen's *d*, which was

used as an effect size test for mean comparisons, provides information about the magnitude of significant associations. According to Cohen's criteria for the behavioural sciences (Cohen, 1988), values lower than 0.20 are indicative of negligible effects; those between 0.20 and 0.49 represent small effects; values between 0.50 and 0.79 are indicative of moderate effects; and large effects are represented by values equal to 0.80 or higher. Secondly, we used factorial ANOVA and ANCOVA to analyze the contributions from the aforementioned variables to SOC, which was the main aim of this study. Specifically, we first used factorial ANOVA to analyze the contributions of the quality of parent-child relationships, teacher support and their interaction to the adolescent's SOC. Afterwards, we conducted an ANCOVA in which the contributions of prosociality and hyperactivity-inattention scores were also accounted for. By means of ANCOVA we wanted to establish whether the contributions from relationships with parents and teachers to SOC remained significant after the role of prosociality and hyperactivity-inattention (the covariables) was taken into account. Partial eta square values in both analyses provide an indication of the magnitude of associations between each predictor and SOC, whereas R^2 provides an indication of the total magnitude of the associations between the examined predictors and SOC in each model. Using Cohen's criteria for the behavioural sciences (Cohen, 1988), R^2 values can be interpreted as negligible (0 to .019), small (.02 to .129), medium (.13 to .259) and large (.26 or greater) and partial eta squared values for the effect of each variable can be considered negligible (lower than .01), small (from .01 to .059), medium (from .06 to .149) or large (.15 or greater).

Given that previous studies in adolescent samples had reported conflicting findings regarding sex differences in SOC (Rivera, García-Moya, Moreno and Ramos, 2013), we had examined the association between sex and SOC as part of preliminary

analyses to decide on the relevance of controlling for this variable in the above mentioned analyses. However, differences in SOC between boys and girls in the present sample were found to be negligible, $F(1,2977) = 16.85, p < .001$, Cohen's $d = 0.15$, and therefore sex was not finally included in the analyses.

Results

Associations between relationships with parents and teachers and adolescent's prosociality and hyperactivity scores

Significant differences in prosociality, $F(8, 2979) = 27.52, p < .001$, and hyperactivity-inattention, $F(8, 2979) = 23.35, p < .001$, were found among adolescents depending on their relationships with parents (partial $\eta^2 = .01$ and partial $\eta^2 = .01$ respectively) and teachers (partial $\eta^2 = .02$ and partial $\eta^2 = .01$ respectively). As shown in Table 1, low quality of parent-child relationships was significantly associated with lower prosocial scores ($p < .001$) and higher hyperactivity-inattention scores ($p < .001$) compared to medium ($d = 0.24$ and $d = 0.31$, respectively) and high ($d = 0.56$ and $d = 0.54$, respectively) quality. Lower prosociality and higher hyperactivity-inattention were also found in adolescents reporting medium-quality parent-child relationships compared to those reporting high-quality relationships ($d = 0.31$ and $d = 0.23$, respectively). Regarding teacher support, high levels of teacher support were significantly associated with higher prosocial scores ($p < .001$) and lower hyperactivity-inattention scores ($p < .001$) compared to medium ($d = 0.39$ and $d = 0.29$, respectively) and low ($d = 0.57$ and $d = 0.46$, respectively) levels. The interaction teacher support by quality of parent-child relationships was non-significant for both models ($p = .42$ for prosociality and $p = .18$ for hyperactivity).

-Table 1-

The contributions from quality of parent child relationships and teacher support to SOC

As a first step, a factorial ANOVA was conducted with quality of parent-child relationships and teacher support as predictors (see table 2). A significant model was obtained that explained 16.6% of the variability in SOC ($p < .001$, adjusted $R^2 = .166$). Quality of parent-child relationships ($p < .001$, partial $\eta^2 = .04$) and teacher support ($p < .001$, partial $\eta^2 = .02$) showed significant associations with a small effect size with SOC. The interaction quality of parent-child relationships by teacher support was non-significant ($p = .05$).

-Table 2-

Next, we conducted an ANCOVA to examine whether the effects of quality of parent-child relationships and teacher support remained significant once prosociality and hyperactivity-inattention were included as covariables. ANCOVA results are summarized in table 3. As shown in table 3, both covariables made significant contributions to the model, which overall accounted for 23.6% of the variability in adolescents' SOC. The magnitude of the covariables contribution was moderate for hyperactivity-inattention (partial $\eta^2 = .06$) and small for prosociality (partial $\eta^2 = .02$). The associations of quality of parent-child relationships and teacher support with SOC remained significant and with a small effect size once the covariables effects were accounted for (partial $\eta^2 = .03$ and partial $\eta^2 = .01$, respectively). The interaction quality of parent-child relationships by teacher support was non-significant ($p = .12$).

-Table 3-

Pairwise comparisons between estimated marginal means (see table 4) showed significant differences in SOC depending on quality of parent-child relationships and teacher support. Low-quality parent-child relationships were significantly associated

with a lower SOC compared to medium-quality and high-quality parent-child relationships ($p < .001$), but non-significant differences in SOC were found between adolescents reporting medium- and high-quality relationships with their parents ($p = .01$). In addition, adolescents reporting high levels of teacher support showed significantly higher SOC scores than those indicating medium ($p < .01$) or low levels ($p < .001$), but no significant differences in SOC were found between adolescents reporting medium and low levels of teacher support ($p = .99$).

-Table 4-

Discussion

The aim of this study was to analyze the contribution of relationships with parents and teachers to young people's SOC while taking into account the potential role of individual differences in prosocial behaviour and hyperactivity-inattention. This objective was based on the assumption that prosociality and hyperactivity-inattention would have significant links with the quality of parent-child relationships and perceived support in relationships with teachers, an assumption which was supported by our preliminary analyses. Specifically, results indicated that adolescents with medium or high quality parent-child relationships and those who perceived high levels of support from their teachers tended to be more prosocial and less likely to present hyperactivity-inattention difficulties. These findings are in line with previous research that shows that positive relationships with parents contribute to socioemotional development and they favour prosocial behaviours and behavioural adjustment (Baumrind, Larzelere and Owens, 2010; Oliva, Parra and Arranz, 2008). Besides, prosocial and attentive students are more likely to be successful in the school (Malecki and Elliot, 2002; Wentzel, 1993). These characteristics are also highly valued by teachers (Harkness et al., 2007; Wentzel, 2010) and consequently they may facilitate close teacher-student relationships.

In the analysis of the contributions from contextual factors to SOC, the obtained results coincide with previous studies (e.g., García-Moya et al., 2012; Natvig, Hanestad and Samdal, 2006), since the quality of parent-child relationships and perceived teacher support were positively associated with SOC; the more positive adolescents' relationships were with their parent and teachers, the higher the likelihood they develop a view of the world as comprehensible, manageable and meaningful. Our findings, however, showed no evidence of an interaction effect in which the role of relationships with teachers depended on the quality of parent-child relationships, as had been hypothesized on the basis of the results from previous research (García-Moya, Moreno and Jiménez-Iglesias, 2013a). Instead, we found independent significant associations of each of these contextual factors with SOC.

Literature on adolescents' relationships with teachers has also shown contrasting views regarding the continuity and discontinuity between teacher-adolescent relationships and parent-adolescent relationships. Some studies show that meaningful relationships with teachers make a greater difference to the life of those lacking supportive adults at home (Eccles, 2004; Luthar, Cicchetti and Becker, 2000; Wentzel, 2010), whereas others claim that teachers are not salient figures for most adolescents and they tend to provide instrumental support which is complementary to positive parent-child relationships (Darling, Hamilton and Hames, 2003). An aspect which may contribute to shedding additional light into this question is the student's age, since it seems that relationships with teachers tend to become less close as the students grow older (Bokhorst, Sumter and Westenberg, 2010). Therefore, it may be the case that the contribution of relationships with teachers may initially be more heterogeneous in younger students and tend to become increasingly homogeneous as these relationships turn normatively less close (Demaray and Malecki, 2003; Eccles, 2004). This aspect

could not be examined in the present study since only late adolescents were part of the sample, but this may be a relevant aspect to understand discrepancies in research results when they come from studies that were conducted in adolescents of different ages. Consequently, more research in this respect would be beneficial to improve our understanding of the continuities and discontinuities between relationships with parents and teachers and their associations with well-being.

In addition, a higher level of explanation of SOC scores was found when incorporating prosociality and hyperactivity-inattention. Therefore, taking into account these individual factors in the analysis of adolescents' SOC provided a more comprehensive view of the analyzed phenomenon, that besides took into consideration the two kinds of GRRs included in Antonovsky's description (1987): contextual and individual. Once the contribution of hyperactivity-inattention and prosociality was taken into account, the effects of relationships with parents and teachers slightly decreased, which may have to do with the aforementioned links which have been found between them (e.g., Harkness et al., 2007; Oliva, Parra and Arranz, 2008). That said, both the quality of parent-child relationships and relationships with teachers remained significant, which underlines the important links between relationships with significant adults in adolescents' lives and the development of their SOC. This finding coincides with the key importance attributed to supportive relationships with significant adults by resilience studies (Masten, 2001). Although, according to effect size tests, the individual unique effect from each variable seemed to be modest, the magnitude of their joint associations with SOC, which reached a level of explained variability of 23.6%, was higher than that found when family factors had been analyzed in isolation in previous research (e.g., García-Moya et al., 2012), and it seems to represent a notable level of explanation when taking into account that a previous analysis on the total contribution

from a number of factors at the individual, home, peer, school and community levels achieved total levels of explained variance in SOC around 50% (Evans, Marsh and Weigel, 2010).

This study has some limitations that should be acknowledged in the interpretation of its findings. First, its cross-sectional design does not allow for conclusions to be drawn about the directionality of the analysed relationships. For instance, prosociality and hyperactivity-inattention can have effects on the likelihood of establishing supportive relationships with teachers (Webster-Stratton and Reid, 2004) while teacher strategies can also promote prosocial behaviour and student's interest and engagement in class (Catalano, Haggerty, Oesterle, Fleming and Hawkins, 2004). Therefore, longitudinal studies are needed to establish the direction of the observed significant associations. In addition, the categorization of the measures on quality of parent-child relationships and teacher support may be considered to bring with it some information loss. However, this methodological decision was strategically made because it maximized the comparability of findings with the recent study on SOC (García-Moya, Moreno and Jiménez-Iglesias, 2013a) which the present study sought to advance further. It is also important to note that the employed cut-off points had been derived from large and representative samples of adolescents and they had been proven to be meaningful in their associations with SOC and other well-being indicators in previous research (e.g., Brooks et al., 2012; García-Moya, Moreno and Jiménez-Iglesias, 2013a). Second, information in this study came exclusively from adolescents' self-reports, which could be viewed as a source of bias. Therefore, in order to make a rigorous interpretation of the present study findings, it is important to keep in mind that results refer to adolescents' perceptions on teacher support, quality of parent-child relationships, etc. It must also be acknowledged that reports can differ among family

members and between family members and observers (Laursen and Collins, 2009). However, several works conclude that adolescents' perceptions not only are more predictive of their well-being than parents' reports (Maurizi, Gershoff and Aber, 2012) but also than external observers' reports, precisely because they are "biased" by the participants' perceptions (Laursen and Collins, 2009). Finally, although not possible in the present study, the incorporation of additional contextual and individual factors, such as peer relationships and empathy or emotional self-regulation respectively, can contribute to enrich future studies. Incorporating socioeconomic measures such as social class and family income in future research would also be beneficial, since previous studies have found significant links between these variables and SOC (e.g., Lundberg, 1997).

Despite those limitations, the present investigation provides significant insights into the understanding of the factors associated with SOC development during adolescence. The main strength of this study is that it goes far beyond previous research on contextual factors contributions to SOC, as it incorporated some relevant individual factors as well. This is in line with Antonovsky's claim (1979, 1987) that GRRs can be found both in contextual and individual factors. Besides, previous studies (e.g., García-Moya, Moreno and Jiménez-Iglesias, 2013a) had also underlined the need to conduct simultaneous analysis of individual and contextual factors to improve our understanding of SOC development, so this study means a valuable first step in this direction. Providing additional information about the continuity or discontinuity between parent-adolescent and teacher-adolescent relationships is another interesting aspect of the present study. Nevertheless, future research that can examine these links throughout the whole period of adolescence would be beneficial to further advance our current understanding of this area.

As stressed in the introduction, making progress in the study of the precursors of SOC is fundamental for the future design of salutogenic interventions to promote well-being (García-Moya and Morgan, 2016). By confirming significant links between supportive relationships with parents and teachers and SOC even after controlling for some individual factors (prosociality and hyperactivity-inattention), the present study makes a novel and valuable contribution to building the necessary evidence base to advance in this direction. In addition, findings from the present study break ground for further research on the role of social and self-regulation skills in SOC development.

Table 1

Descriptives of prosociality and hyperactivity scores by quality of parent-child relationships and teacher support

	<i>N</i>	Prosociality		Hyperactivity-Inattention	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Quality of parent-child relationships					
Low	1118	7.20	1.81	4.98	1.94
Medium	1040	7.64	1.81	4.38	1.96
High	821	8.20	1.76	3.91	2.07
Teacher support					
Low	132	6.80	2.04	5.25	1.87
Medium	586	7.11	1.92	4.91	2.01
High	2261	7.81	1.76	4.32	2.02
Total	2979	7.63	1.84	4.48	2.03

Table 2

Factorial ANOVA of quality of parent-child relationships and teacher support on SOC

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	partial η^2
Corrected model	267.974	8	33.497	75.178	.000	.168
Intercept	14543.070	1	14543.070	32639.546	.000	.917
Quality of parent-child relationships	47.870	2	23.935	53.718	.000	.035
Teacher support	30.747	2	15.374	34.504	.000	.023
Quality of parent-child relationships by teacher support	4.229	4	1.057	2.373	.050	.003
Error	1323.331	2970	.446			
Total	63932.192	2979				
Corrected total	1591.305	2978				

Table 3

ANCOVA of quality of parent-child relationships and teacher support on SOC, including prosociality and hyperactivity as covariables

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	partial η^2
Corrected model	379.134	10	37.913	92.831	.000	.238
Intercept	2044.877	1	2044.877	5006.880	.000	.628
Prosociality	27.301	1	27.301	66.846	.000	.022
Hyperactivity-inattention	74.807	1	74.807	183.164	.000	.058
Quality of parent-child relationships	31.801	2	15.900	38.932	.000	.026
Teacher support	14.071	2	7.036	17.227	.000	.011
Quality of parent-child relationships by teacher support	3.017	4	.754	1.847	.117	.002
Error	1212.171	2968	.408			
Total	63932.192	2979				
Corrected total	1591.305	2978				

Table 4

Estimated marginal means and 95% CIs of SOC by quality of parent-child relationships and teacher support

	<i>M</i>	<i>SE</i>	95% CI	Mean difference	95% CI
Quality of parent-child relationships					
Low (L)	4.26	.03	4.20,4.31	L-M -.29**	(-.40, -.17)
Medium (M)	4.54	.04	4.47,4.62	L-H -.48**	(-.62, -.33)
High (H)	4.73	.05	4.63,4.83	M-H -.19	(-.34, -.03)
Teacher support					
Low (L)	4.43	.06	4.30,4.55	L-M -.04	(-.21, .13)
Medium (M)	4.47	.03	4.41,4.53	L-H -.21*	(-.37, -.06)
High (H)	4.64	.01	4.61,4.66	M-H -.17**	(-.25, -.09)

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

Note: Covariates appearing in the model are evaluated at the following values: Prosociality = 7.63, Hyperactivity-inattention = 4.48.

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