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**Analysis of the importance of family in the development of sense of coherence
during adolescence**

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Abstract

Aims: The aim of this work was to study the influence of several family dimensions on SOC in adolescence, controlling the possible effects from the demographic variables, gender and age.

Methods: The sample consisted of 7580 adolescents between the ages of 13 and 18, who had taken part in the 2010 edition of the WHO Health Behaviour in School-aged Children study in Spain.

Results: The results showed that there were no significant gender differences in SOC levels. However, age had a significant influence on SOC. Higher levels of SOC were found in adolescents aged 13 and 14 compared to older participants. Family variables explained 18 per cent of SOC variability, with affection, easy communication with parents and parental knowledge as the most outstanding variables. In addition, positive relationships between parents and family affluence had a significant role in explaining SOC levels.

Conclusion: The results suggest that the family context plays an important role in providing meaningful experiences for the development of a strong SOC in adolescence.

Key Words: sense of coherence, salutogenesis, family, adolescence.

Introduction

A new approach to health, the salutogenic theory and model, was proposed by Aaron Antonovsky in 1979 as an alternative to the pathogenic model that historically had dominated Public Health[1]. The salutogenic model involves three main changes in the study of health and its determinants. Firstly, replacing the dichotomy between health and disease with a new perspective where health is seen as a continuum between the health/ease and the unhealth/dis-ease endpoints. As a result of this, interventions in Health Promotion are broadened to involve the whole population, not only people who are ill or at risk. Finally, the salutogenic model focuses on the identification of factors promoting health, so called salutary factors, instead of focusing only on risks or factors related to different diseases.

The original salutogenic model is a sociological system-approach to health that can be seen as an interdisciplinary framework under which several concepts from Positive Psychology can be included. The model has been useful to guide the direction of research and interventions in Health Promotion[2-5], because it shares the basic principle that Health Promotion should be aimed at the population as a whole in the context of daily life, instead of only focusing on people at risk of disease[6].

Since the 90s a significant amount of research has been devoted to the core concept of the salutogenic model: sense of coherence (SOC). More than 500 studies about this topic were carried out between 1992 and 2003 and the trend is on an increase[7,8].

SOC has been defined as ‘a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli deriving from one’s internal and external environments in the course of living are

structured, predictable and explicable (comprehensibility); (2) the resources are available to one to meet the demands posed by the stimuli (manageability); and (3) these demands are challenges, worthy of investment and engagement (meaningfulness)'[9].

The reason why SOC has become so popular is twofold. Not only is SOC a relevant construct in understanding stress perceptions and coping, but it also has shown strong positive associations with health, emotional well-being and quality of life[7,8].

Despite its important role in explaining health, little research has been devoted to the mechanisms that promote the development of a strong SOC, since the vast majority of research has focused on the study of the relationships between SOC and health outcomes.

Antonovsky[9] pointed out that social and historical factors but also daily-life contexts may have an important role in providing meaningful experiences in SOC development and empirical support has been found for the importance of proximate contexts in explaining SOC[10], a finding that has been replicated by different works that have shown that family[11], school[12] and neighbourhood factors[13,14] are significantly associated with people's SOC.

Focusing on family influences, Antonovsky[9] stated that childhood conditions related to the family social position, economic situation and social relationships influenced individuals' SOC. The importance of family experiences in promoting a strong SOC can be understood when taking into account the characteristics of the positive experiences for SOC development described by Antonovsky[9]. Creating a consistency in life experiences, which involves the perception that environmental events are ordered and structured more than chaotic, promotes the sense of comprehensibility.

A proper balance between demands and resources to deal with them strengthens the individual's perception that stressors can be tackled easily, thus promoting the manageability component. Lastly, participating in outcomes implies person's perception of having an active role in their life and destiny, increasing people's motivation to face challenges and commit themselves to different domains of life (meaningfulness dimension).

Despite the rather small amount of research about family influences and SOC, the family context seems to be one of the most influent scenarios in shaping a strong SOC[11], since trusting relationships with at least one of the parents[15], closeness in family relationships[10] and the absence of family conflict[13] seem to have positive effects in adolescents' SOC.

Furthermore, adolescence is a relevant period to study the factors that shape adult SOC because it's a crucial stage in the life span where the personal identity and health-related behaviours are formed. Besides, studying the factors that influence the development and maintenance of a strong SOC in adolescence has been proposed as the way to gain knowledge about the origins and the development process of SOC[11,13].

Taking into account the importance of family in adolescents' well-being, this work is aimed at examining the role of different dimensions of the family context in the development of SOC. The influence of demographic variables is also analyzed since this is one of the first works that studies SOC in Spanish population.

Methods

This study is based on data from the Spanish portion of the 2010 edition of the international survey Health Behaviour in School-aged Children (HBSC) study, a WHO

international project that collects data about adolescents' lifestyles every four years in about 40 countries from different continents.

Participants

As part of the 2010 edition of the international survey Health Behaviour in School-aged Children (HBSC) in Spain, a national representative sample of adolescents was drawn. Adolescents between the ages of 13 and 18 were selected from the original Spanish sample for this study. Therefore, the sample consisted of 7580 adolescents (3672 boys and 3908 girls) with a mean age of 15.41.

Measures

Variables were measured using the relevant items from the 2010 edition HBSC Spanish questionnaire. The questionnaire had been approved by the Research Ethical Committee of the University of Seville. The following variables were included:

-Sociodemographic variables: gender and age.

-Family affluence. Taking into account adolescents' difficulties in answering direct questions about their family's socioeconomic status, this variable was assessed by means of the Family Affluence Scale II, *FAS-II*[16]. Total scores range from 0 to 9, and three ordinal levels can be differentiated according to Boyce, Torsheim, Currie, et al.[17].

- Perceived family wealth. Adolescents were asked *How well off do you think your family is?* For the descriptive data analysis this variable was coded in three levels: *Low* (*not so well off* and *not at all well off*), *Medium* (*average* and *quite well off*) and *High* (*very well off*).

- Affection. The affection dimension of the short version (PBI-BC) of the classic *Parental Bonding Instrument* was used[18]. Scores ranged from 0 to 2.

-Ease of communication with parents. Participants were asked *How easy is it for you to talk to the following persons about things that really bother you?* For the data analysis this variable was collapsed into three levels: *difficult communication*, *easy communication* and *very easy communication*.

-Parental knowledge. The measure of parental knowledge was based on the scale developed by Brown, Mounts, Lamborn et al.[19] that asks adolescents about how much father and mother (separately) knows about five issues: *who your friends are?*, *how you spend your money?*, *where you are after school?*, *where you go at night?*, *what you do with your free time?* The final score ranged from 0 to 2, where higher values represent higher levels of parental knowledge.

-Frequency of family activities. Participants were asked how often did they and their families spend time together in different activities (watching TV, playing indoor games, eating a meal, going for a walk, playing sports...). An average total score was obtained which ranged from 0 to 7 days.

-Quality of the relationships between parents. This variable was measured by means of an item based on Cantril's Ladder[20]. Adolescents were asked *In general how satisfied are you with the relationships between your parents?* and answered by ticking the number which best described their feelings from a scale between 0 (*My parents have very bad relationships*) and 10 (*My parents have very good relationships*).

-Sense of coherence (SOC). This variable was measured by using the SOC-29 Scale[9]. It consists of 29 items answered in a Likert scale of 7 values with two bipolar anchoring phrases. The global score is the average of the answers given to the 29 items and ranges

from 1 to 7. The higher the score, the stronger the SOC it represents. In this study the scale showed a Cronbach alpha of 0.87.

Procedure

Information was obtained by means of anonymous on-line questionnaires that were filled in by the students during a regular school-hour in accordance with the HBSC international standardized procedure. The sessions were supervised by teaching staff. Students' anonymity was guaranteed.

One-way ANOVA and effect size statistics (Cohen's d) were used to evaluate differences in the reported degree of SOC depending on demographic and family variables. Cohen[21] proposed the following criteria for the interpretation of d in social sciences according to which effect size can be considered negligible (lower than 0.20), small (from 0.20 to 0.49), medium (from 0.50 to 0.79) and large (higher than 0.80). An additional criterion by Wolf[22] is available, according to which d values higher than 0.50 are interpreted as practically/clinically significant effects.

Secondly, stepwise multiple regression was employed for building the hierarchy of variables in explaining SOC. All variables were used as scales in this analysis, with the exception of gender, which was entered as a dummy variable. Also, separate measures for mother and father were combined in order to avoid multicollinearity problems. Initially, a model was estimated in which all the examined variables were entered. Afterwards, a stepwise process of adjustment was conducted, so that the variables whose contribution to the level of explanation was negligible (r^2 lower than .005) could be removed. The model was estimated again after every removal until a parsimonious final hierarchy was obtained which included only those predictors that made a significant individual contribution to the model.

Results

Demographic variables and SOC

Differences in SOC between boys and girls were negligible ($F_{(1, 7578)} = 16.97, p < .001; d = 0.09$). In contrast, age had a significant influence since SOC was significantly higher in adolescents aged 13 and 14 than in those aged between 15 and 18 ($F_{(2, 7577)} = 79.84, p < .001$). Effect size associated with these differences was small with respect to both 15 and 16 years old adolescents ($d = 0.27$) and 17 and 18 years old ($d = 0.37$).

In addition, differences associated with the combination of gender and age were found ($F_{(5, 7574)} = 20.76, p < .001$). Specifically, girls aged between 15 and 16 showed lower levels of SOC than girls between the ages of 13 and 14 ($d = 0.33$), whereas these differences were negligible in the case of boys ($d = 0.19$). In boys, differences were only significant between those aged 13 and 14 compared to the ones aged 17 and 18 ($d = 0.31$).

Family variables and SOC

Before elaborating the hierarchy of variables in the explanation of SOC, bivariate analysis, which involved the study of the separate effect of each family variable on SOC, were conducted. As can be seen in Table I, these analyses showed that all family variables had a significant influence on SOC.

The final regression model appears in Table II. Results showed that including the variables gender, perceived family wealth and frequency of family activities increased the R^2 value by only 0.002 points, thus not having a relevant role in explaining SOC levels. Age explained only 1.8% of the variability in SOC scores. However, including family variables, as can be seen in Model 2, implied an increase of

18 points in the level of explanation which resulted in a total percentage of explained variability close to 20%.

As for the magnitude of each variable's influence, standardized coefficients showed that the most influential variables were affection ($\beta = .177$), parental knowledge ($\beta = .165$) and ease of communication with parents ($\beta = .127$). Quality of marital relationships and family affluence also had a significant effect on SOC.

Discussion

Demographic variables' influence on SOC

Results showed that there were not significant differences in SOC between adolescent boys and girls. This finding is in line with previous research on adolescent SOC[13,23] and it could be attributed to the fact that SOC is a global disposition which is shaped by multiple experiences from different contexts, as well as several individual characteristics. For that reason, gender may not have such a determinant role in explaining differences in SOC levels.

On the other hand, there are studies that have found higher levels of SOC in men than in women in adolescence[24-26] and, especially, in adulthood[27-29]. The disparity in research results about this topic makes it advisable to continue exploring the role of gender in the development of SOC.

Regarding age, 13 and 14 year-old adolescents showed a stronger SOC than 15 to 18 years old. Although this result may seem contradictory to the idea that SOC tends to strengthen across the life span[8,9], it is similar to the conclusions drawn from other studies with adolescent populations[12,30]. Therefore, this transitory decrease that seems to take place around middle and late adolescence may be related to some of the changes and the developmental tasks associated with the adolescent stage. Thus, lower

levels of SOC in older adolescents could be related to the crisis status described by Marcia as part of the personal identity development process[31] or to any of the changes associated to the adolescent stage[32], such as changes in the self-concept, the adolescents' increasing cognitive abilities or their need to adopt new roles in some of their main contexts. That is the case of school, where adolescents face the transition from primary to secondary education, and of the peer group in which popularity becomes more and more important and romantic relationships start.

Furthermore, results show that there could be different patterns in the development of SOC for boys and girls, since that transitory decrease in SOC during adolescence could occur earlier in girls, who seem to be more precocious for some of the aforementioned changes[32,33]. Future research must deepen scientific knowledge about these issues.

Influence of family variables in SOC development during adolescence

As for the role of family variables in SOC development, the results of this work point out that the family context is an important scenario in adolescents' SOC. First, all family variables had a significant individual influence on SOC during adolescence. Furthermore, family variables as a whole contributed significantly to the explanation of SOC, since they accounted for 18% of the explained variability in SOC scores, after controlling for age. That level of explanation is remarkably high when considering that this work didn't include the influences from other relevant contexts such as school, peers or neighbourhood.

In addition, the hierarchy of variables showed that the most influential family dimensions were affection, ease of communication and parental knowledge, which coincide with the findings from previous research on adolescence, that has shown that affection and communication with parents[34-36], as well as parental knowledge[37,38]

are key elements for adolescents' well-being. Quality of relationships between parents also had a significant effect on SOC, which coincides with studies that have warned about the negative effects of parental conflict for adolescents' development[39,40], and with other studies on salutogenesis that has indicated that the negative effect of parental conflict seems to impact the levels of SOC in both adolescence[13] and adulthood[41]. Finally, family affluence also had an important influence on adolescents' SOC, which confirms that socioeconomic status is a relevant variable in the explanation of health. This finding also underlines the need to address social inequalities in health. Moreover, this evidence coincides with theoretical approaches[9] and empirical research[41,42] that have pointed out economic wealth as a general resistance resource which increases people's opportunities to have SOC-promoting experiences.

To sum up, results from this study highlight the importance of family in the development of a strong SOC, suggesting that adolescents will be more likely to develop a strong SOC when two elements are present in their family context: a positive family dynamic (high levels of affection and parental knowledge, easy communication with parents and good relationships between the parents) and the security and opportunities that a good level of family affluence provides.

Limitations and future research directions

Some limitations must be taken into account in the interpretation of the results of this work. They mainly have to do with the cross-sectional design of the study, which doesn't allow us to draw definitive conclusions regarding the direction of the examined relationships, for example the influence of age. Another limitation is not having included variables from other relevant ecological levels during adolescence (school, peers or neighbourhood) in the explanation of SOC. Although the lack of studies on the role of the family context in SOC development during adolescence made it necessary to

conduct the present study in order to analyze the contributions from different family dimensions, other developmental contexts provide meaningful experiences in adolescence that could contribute to a better explanation of SOC and may even moderate some of the described effects. Consequently, future research is needed that studies the effects from several developmental contexts in SOC simultaneously.

Despite that, this work is an important contribution to the study of the role of the family context in the promotion of adolescents' adjustment and well-being and it has been carried out adopting a salutogenic approach in the study of health. Furthermore, this is an innovative study, since it is one of the first Spanish works about SOC and, to our knowledge, the first one in Spain that has evaluated SOC in a large sample of adolescents. Besides, even at an international level, this study is one of the few works, to date, that have been devoted to the study of the role of family variables in the development of SOC. For all those reasons, this work highlights the potential of examining developmental contexts in identifying important variables in shaping a strong SOC and breaks ground for further research on family and other developmental contexts that could contribute to clarification and deepening understanding of our findings.

Although more research is needed about SOC timetrends, it seems that SOC (with the exception of mid-late adolescence) tends to increase with age, and this has been interpreted as an indication that it is a question of a life-long learning process[8]. Furthermore, stability in SOC during adolescence has been found especially in individuals with an initially high SOC[43], which can be seen as an opportunity to change for adolescents with a low SOC. In line with some in-progress experimental studies that show that families who have a capability of developing a reflective dialogue based on a deep sense of trust will strengthen the SOC of the adolescents[44,45], the

present study points to the family context as a potentially relevant setting for interventions aimed at improving adolescents' SOC. Specifically, supporting communication and parental knowledge as well as reinforcing good relationships between parents may be suggested as important aspects when thinking about interventions that could improve SOC in adolescence. However, we still lack detailed longitudinal and qualitative studies and interventions that could improve knowledge in this area.

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Declaration of conflicting interests

Authors declare that there is no conflict of interest.

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Table I. Mean values and one-way ANOVA of SOC by family variables

| | N | M (SD) | 95% CI | F | Cohen's d |
|---------------------------------------|----------|---------------|---------------|----------|------------------|
| <i>Family affluence</i> | | | | 62.43* | |
| Low (0 to 3) | 694 | 4.37 (.73) | [4.31, 4.42] | | Low-medium 0.23 |
| Medium (4 to 6) | 3673 | 4.54 (.74) | [4.52, 4.57] | | Medium-high 0.20 |
| High (7-9) | 3113 | 4.69 (.76) | [4.66, 4.72] | | Low-high 0.42 |
| Total | 7480 | 4.59 (.75) | [4.57, 4.60] | | |
| <i>Perceived family wealth</i> | | | | 95.75* | |
| Low | 511 | 4.15 (.78) | [4.09, 4.22] | | Low-medium 0.63 |
| Medium | 6907 | 4.62 (.74) | [4.60, 4.64] | | Medium-high 0.20 |
| High | 141 | 4.48 (.70) | [4.36, 4.59] | | Low-high 0.43 |
| Total | 7559 | 4.59 (.75) | [4.57, 4.60] | | |
| <i>Ease communication with father</i> | | | | 264.64* | |
| Difficult | 2644 | 4.35 (.72) | [4.33, 4.38] | | Low-medium 0.50 |
| Easy | 2985 | 4.70 (.69) | [4.67, 4.72] | | Medium-high 0.21 |
| Very easy | 1474 | 4.85 (.80) | [4.81, 4.89] | | Low-high 0.67 |
| Total | 7103 | 4.60 (.75) | [4.58, 4.62] | | |
| <i>Ease communication with mother</i> | | | | 29.86* | |
| Difficult | 1334 | 4.26 (.71) | [4.22, 4.30] | | Low-medium 0.46 |
| Easy | 3263 | 4.58 (.69) | [4.55, 4.60] | | Medium-high 0.27 |
| Very easy | 2715 | 4.78 (.78) | [4.75, 4.81] | | Low-high 0.69 |
| Total | 7312 | 4.59 (.75) | [4.58, 4.61] | | |
| <i>Maternal affection</i> | | | | 314.10* | |
| Low (0 to 0.5) | 240 | 3.95 (.71) | [3.85, 4.04] | | Low-medium 0.47 |
| Medium (0.51 to 1.25) | 1362 | 4.25 (.65) | [4.22, 4.29] | | Medium-high 0.64 |
| High (1.26 to 2) | 5719 | 4.71(.74) | [4.69, 4.72] | | Low-high 1.04 |
| Total | 7321 | 4.60 (.76) | [4.58, 4.61] | | |

| | | | | | |
|---|------|-----------|--------------|-------------|------|
| <i>Paternal affection</i> | | | | 338.64* | |
| Low (0 to 0.5) | 621 | 4.07(.75) | [4.01, 4.13] | Low-medium | 0.53 |
| Medium (0.51 to 1.25) | 2078 | 4.43(.66) | [4.40, 4.46] | Medium-high | 0.46 |
| High (1.26 to 2) | 4290 | 4.76(.74) | [4.74, 4.79] | Low-high | 0.93 |
| Total | 6989 | 4.60(.75) | [4.58, 4.62] | | |
| <i>Maternal knowledge</i> | | | | 166.14* | |
| Low (0 to 0.5) | 115 | 4.03(.70) | [3.90, 4.16] | Low-medium | 0.36 |
| Medium (0.51 to 1.25) | 1054 | 4.27(.67) | [4.23, 4.31] | Medium-high | 0.54 |
| High (1.26 to 2) | 6092 | 4.67(.75) | [4.65, 4.68] | Low-high | 0.85 |
| Total | 7261 | 4.60(.75) | [4.58, 4.62] | | |
| <i>Paternal knowledge</i> | | | | 281.44* | |
| Low (0 to 0.5) | 597 | 4.19(.72) | [4.13, 4.25] | Low-medium | 0.28 |
| Medium (0.51 to 1.25) | 1867 | 4.38(.67) | [4.35, 4.41] | Medium-high | 0.51 |
| High (1.26 to 2) | 4471 | 4.75(.75) | [4.73, 4.78] | Low-high | 0.75 |
| Total | 6935 | 4.60(.75) | [4.59, 4.62] | | |
| <i>Frequency of family activities</i> | | | | 152.55* | |
| Low (0 to 2) | 4320 | 4.47(.73) | [4.45, 4.49] | Low-medium | 0.42 |
| Medium (2.1 to 3) | 2390 | 4.78(.75) | [4.75, 4.81] | Medium-high | 0.01 |
| High (3.1 to 7) | 586 | 4.77(.80) | [4.71, 4.84] | Low-high | 0.41 |
| Total | 7296 | 4.59(.76) | [4.56, 4.61] | | |
| <i>Quality of the relationships between parents</i> | | | | 184.95* | |
| Low (0 to 3) | 730 | 4.29(.75) | [4.24, 4.35] | Low-medium | 0.10 |
| Medium (4 to 7) | 1467 | 4.36(.70) | [4.33, 4.40] | Medium-high | 0.46 |
| High (8 to 10) | 5263 | 4.70(.74) | [4.68, 4.72] | Low-high | 0.55 |
| Total | 7460 | 4.59(.75) | [4.57, 4.61] | | |

* $p < .001$

Table II. Regression coefficients for linear association between SOC and family variables, controlling the effect of gender and age

| Variable | <i>B</i> | Standard error | β | <i>R</i> ² | ΔR^2 | <i>rs</i> ² |
|----------------------------------|----------|----------------|---------|-----------------------|--------------|------------------------|
| <i>Model 1</i> | | | | .018* | -- | |
| Age | -.072 | .007 | -.135* | | | |
| <i>Model 2</i> | | | | .198* | .181* | |
| Age | -.043 | .006 | -.082* | | | .007 |
| Family affluence | .030 | .005 | .070* | | | .005 |
| Affection | .165 | .014 | .177* | | | .018 |
| Parental knowledge | .152 | .012 | .165* | | | .020 |
| Communication | .066 | .007 | .127* | | | .012 |
| Quality of marital relationships | .026 | .004 | .080* | | | .005 |

Note: The estimation of a contrast model, in which variables that had not been included in the final model (gender, perceived family wealth and frequency of family activities) were entered, resulted in an increase in *R*² of 0.002, which indicated that they did not contribute significantly in the explanation of SOC.

**p* < .001