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Developmental contexts and sense of coherence in adolescence: a systematic review

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Abstract

The salutogenic model has led to revolutionary changes in the study of health. In recent years, a large amount of research has been carried out on the relationship between SOC and health, but relatively little is known about SOC in adolescence. This work is a systematic review of the studies that looked at SOC in adolescent samples. Valuable information is provided regarding the characteristics of the samples, the reliability of the SOC scale versions, the influence of demographic variables, and how family, school, peers, and neighbourhood impact SOC development. Furthermore, future directions for the study of SOC in adolescence are provided.

Developed by Aaron Antonovsky in the late 70s, the salutogenic model was a response to the pathogenic model (focused on identifying risk factors for distress and illness) that was dominating public health research at the time.

The salutogenic model represented a revolutionary change in perspective due to its interest in health-promoting factors and increasing the quality of life in the whole population. More recently, the salutogenic model has become a model of reference for the development of health-promoting interventions and an integrative theoretical framework that brings together several concepts from different disciplines (Eriksson and Lindström, 2006, 2008).

Furthermore, the salutogenic model is the first to examine the sense of coherence (SOC)— a new construct that is strongly related to health and quality of life. As a consequence, SOC has drawn attention from a growing number of researchers representing a wide range of disciplines, such as Medicine, Psychology, Public Health, and Sociology.

SOC is a global disposition, present in everyday life, that conditions the way in which an individual reacts to life demands and the extent to which the individual is affected by those demands. SOC is composed of three highly interrelated dimensions that, together, play a fundamental role in successful coping (Antonovsky, 1987). The three dimensions include comprehensibility (the capacity to perceive the world and life events as understandable, ordered and, to some extent, predictable), manageability (the confidence that one has the necessary resources to deal with environmental demands successfully), and meaningfulness (the belief that life is worthwhile and that the challenges in life deserve the investment of effort and resources).

After formulating the concept of SOC, Antonovsky (1987) developed an instrument— the *Orientation to Life Questionnaire* (also known as the *SOC Scale*)— to measure it. The original instrument (SOC-29), consisting of 29 items, has been reviewed and shortened into versions such as the SOC-13 and SOC-9. Domain-specific versions have also been developed, including the FSOC for the family context and the CSOC for children. The availability of a measurement instrument developed specifically for assessing SOC may have encouraged more research on this construct than on similar concepts such as hardiness (Kobasa, 1979).

Thus, numerous studies have been conducted to examine the relationship between SOC and health in adults. The large body of work motivated two seminal reviews that integrated the collective findings of more than 500 papers published on this topic between 1992 and 2003 (Eriksson and Lindström, 2006, 2007). In contrast, little is known about SOC during childhood and adolescence, despite the fact that these developmental stages, especially adolescence, are considered by some researchers as being fundamental to the shaping of SOC (Cederblad et al., 1994; Lundberg, 1997). Furthermore, there has been empirical evidence supporting a relationship between SOC, health-related behaviour, and well-being during adolescence (Honkinen et al., 2005; Nielsen and Hansson, 2007).

At the same time, Antonovsky (1996) believed that upon confirming the relevance of SOC as an explanatory factor for health, research should be devoted to identifying the factors that facilitate the development of a strong SOC. According to the author, experiences that promote SOC should involve a consistency in life circumstances, a balance between life demands and available resources, and participation, that is, the possibility of playing an active role in life.

However, despite Antonovsky's emphasis on the need to identify SOC-promoting factors, surprisingly little is known about the process of SOC development and the factors that influence that process.

Some authors point to adolescence as a crucial stage for exploring both the origins and the development of SOC (Evans et al., 2010; Marsh et al., 2007). In particular, the past few years have seen more research devoted to the study of SOC in adolescence. Although a valuable body of results is beginning to form, the lack of systematisation make it difficult to achieve a full understanding of the phenomenon.

In response, this work provides a systematic review of the research on SOC in adolescence conducted between 1986 and 2011. Specifically, we took into account multiple aspects of the research, including the types of samples, the reliability of the different versions of the SOC scale, the influence of gender and age on the development of SOC, and the impact of the different developmental contexts (family, school, peers, and neighbourhood) on SOC development. By presenting accurate and systematic information on the above issues, we hope our review can serve as a starting point for future investigations into adolescent SOC.

Method

Search strategy

This work involved the review of a total of 1458 studies on SOC that were reported in English and published between 1979 and 2011. Studies were identified by means of a systematic search process in a variety of databases including *Proquest, PubMed, Ovid SP, Wiley Online Library,*

and *ISI Web of Knowledge*. *Sense of coherence*, *salutogenesis, salutogenic*, *Antonovsky,* and *Orientation to Life Questionnaire* were used as keywords in our search.

From the 1458 studies, scientific research articles were selected and further narrowed down into a final set that included only the studies focusing on SOC in adolescence. The final selection employed as a criterion the appearance of the words *adolesc*, children, youth, students* or *school-age* in the title, abstract or keywords.

Inclusion and exclusion criteria

For the purpose of our analysis, adolescent samples included samples with participants between 11 and 18 years of age. When the age range of the participants was broader, the mean age was used as the criterion of reference. In other words, if a study sample had a mean age between 11 and 18 years, the study was included in the review. Conversely, if the mean age of a study sample was below 11 or above 18 years, the study was excluded. For studies that were based on a general population that included adolescents, we excluded the studies in which participants were not differentiated by age. However, when participants were differentiated by age, only the data from the adolescent subset were included in the review. Finally, studies that looked at SOC in undergraduate students were excluded.

Final material and procedure

The implementation of the search strategy and inclusion and exclusion criteria described above resulted in a final set of 68 research papers (see Appendix 1). The papers were examined using a standardised protocol that looked at a wide variety of indicators (see supplementary material).

In the following section, we present data on the size and characteristics of the samples, the different versions of the SOC scale and their reliability, the influence of demographic variables (gender and age), and the relationships between SOC and variables related to the main contexts (i.e., family, school, peer group, and neighbourhood) of adolescent development .

Results

Sample size and characteristics

Together, the 68 studies examining SOC in adolescence provided data on a total of 84,771 adolescents. The large number resulted from the fact that more than half of the reviewed studies (57.35%) involved samples of over 500 participants and that 38.23% of the studies involved over 1,000 participants. All these studies were quantitative and the vast majority of them employed a cross-sectional design (only 7 studies were longitudinal). In addition, most studies had been carried out with adolescents from Scandinavian countries (44%) and Israel (21%), whereas the rest of the studies employed samples from diverse countries in America, Europe Africa and Asia.

Regarding the characteristics of the samples, 44 out of 68 studies employed normative samples. Thus, 70,818 adolescents (or, 83.54% of the total number) represented the normative population. The remaining studies involved a wide variety of samples that included clinical samples and adolescents with special characteristics or who lived in high-risk environments (e.g., Gustafsson, Nelson and Gustafsson, 2010; Edbom et al., 2010).

Versions of the questionnaire and reliability

Comparing across different versions of the questionnaire used in the study of SOC in adolescence (see Table 1), we found that the SOC-13 was the most frequently used version, being used in 54% of the reviewed studies. This shortened version of the SOC Scale had good reliability (with an average Cronbach's alpha of 0.82). The next most widely used version was the original SOC-29, which was employed in 15% of the studies and also had good reliability (average Cronbach's alpha of 0.88). Other versions of the SOC scale (CSOC, FSOC, SOSC, and *ad hoc* selections of items for specific studies) were used less frequently and their reliability tended to be more modest or even questionable.

- INSERT Table 1 HERE-

Demographic variables and SOC

In terms of the impact of gender and age on SOC during adolescence, the research conducted to date appears to be producing contradictory results.

Only 28 out of 68 studies on SOC in adolescence examined the influence of gender on SOC. Of the 28 studies, 32.14% concluded that no significant differences existed between boys and girls, whereas 67.86% reported higher levels of SOC in adolescent boys. In a first attempt to clarify these contradictory results, we conducted an in-depth examination of the 18 studies that provided enough information for the calculation of effect size based on Cohen's *d.* Effect size values suggested that boys had higher levels of SOC in 12 of the 18 studies, but no differences were found in the remaining six studies. Nonetheless, whenever differences were found, the effect size was low, ranging from 0.2 to 0.4 (Axelsson et al., 2005; Buddeberg-Fischer,

Kalghofer and Schnyder, 2001; Dorri, Sheiham and Watt, 2010; Hansson, Olsson and Cederblad, 2004; Honkinen et al., 2009; Kristensson & Öhlund, 2005; Margalit & Eysenck, 1990; Marsh et al., 2007; Moksnes et al., 2010; Natvig, Hannestad and Samdal, 2006; Nielsen and Hansson, 2007; Nilsson et al., 2007; Simonsson et al., 2008; Sollerhed, Ejlertsson and Apitzsch, 2005), with the exception of one study that reported a medium effect size (d = 0.64) (Myrin and Lagerström, 2008).

The influence of age was examined in 16 out of the 68 studies. The one longitudinal study in our sample (Honkinen et al., 2008) showed negligible differences (d = 0.02) in SOC levels as participant age increased from 15 to 18 years. Cross-sectional studies reported dissimilar results. However, given that nine of the cross-sectional studies found no significant differences based on adolescent age (Jellesma et al., 2006; Koushede and Holstein, 2009; Kristensson and Öhlund, 2005; Margalit and Eysenck, 1990; Moksnes et al., 2010; Nash, 2002; Nilsson et al., 2007; Räty, Larsson and Söderfeldt, 2003; Simonsson et al., 2008), there seemed to be stronger support for the stability in SOC during adolescence. Significant differences were found in the remaining six studies, but the direction of the influence was not clear and effect size values tended to be low.

Taking into account the frequent reports made in developmental psychology research of gender differences in psychological and social development, we conducted a combined analysis of gender and age to more closely examine the influence of gender in the adolescent SOC. The mean age was used as a reference and effect size values were calculated using Cohen's *d.* This

procedure was performed on all studies that provided the necessary data, that is, 19 of the 27 studies that analysed the influence of gender.

The results showed that gender differences in SOC levels depended on participant age group. Specifically, five out of the six studies that sampled adolescents younger than 15 years revealed no gender difference in SOC. In contrast, all studies (a total of eight) that sampled 15- to 18-year-old adolescents showed significantly higher SOC levels in boys than in girls. In the case of adolescents older than 18, findings were mixed, with three studies supporting higher SOC levels in boys than in girls and two studies failing to find significant differences associated with gender.

Developmental contexts and SOC

Of the 68 studies on SOC in adolescence, 21 studies included the analysis of at least one variable related to the main developmental contexts in adolescence, which include family, school, peer group, and neighbourhood. Six of the studies included variables related to more than one context. Nonetheless, different contexts received different levels of research attention (see Figure 1). Specifically, whereas the vast majority of research that considered development contexts included variables related to family or school, there was little attention toward peer group and neighbourhood influences.

- INSERT Figure 1 HERE-

<u>Family</u>

Out of the 68 studies reviewed, only 13 examined the influence of family related variables on the development of SOC. However, the family context was the one that received more attention, featuring as a focus of research in 19.12% of the studies.

The first attempts to study the family context were led by Margalit (1985) and Helen Antonovsky (Antonovsky and Sagy, 1986) in the 80s. However, the majority of attempts to look at the family context and SOC in adolescence have begun only recently, with the first paper published in 2000 (Sagy and Antonovsky, 2000). For the rest of the research on this topic, more than 60% of the studies were not published until 2006 or later.

Different approaches have been adopted in the study of the relationship between the family context and SOC. Some studies focused on family variables that might have negative effects on SOC development, whereas others focused on dimensions from the family context that might promote a strong SOC. Studies focusing on the impact of stressful family events, such as illness or death of a family member (Ristkari et al., 2008), family context as a potential source of stress (Moksnes et al., 2010), family conflict (Marsh et al., 2007) or maltreatment at home (Sagy and Dotan, 2001) represent examples of the first approach and show a negative association between all of those stressful events and adolescent SOC.

On the other hand, studies focusing on the family related factors that promote a strong SOC have shown that support from family members (Margalit, 1985), encouragement of personal growth (Marsh et al., 2007), and a positive climate in family relationships (Olsson et al., 2006) tend to have a significant positive influence on SOC levels.

To summarise, all the studies that looked at the relationship between family variables and SOC (13 studies) suggested that family related factors were relevant (in either a facilitative or inhibitory sense) for adolescent SOC development.

School

Twelve studies were found to include school-related variables in the study of SOC in adolescence, with the vast majority of these studies published after 2000.

Given that a bidirectional relationship exists between school and SOC, two approaches pervade in their study. On the one hand, school attendance and school demands have been considered a normative source of stress that could challenge adolescents' SOC. On the other hand, school has also been seen as a context of socialisation with the potential to provide SOC-promoting experiences.

Studies endorsing the first approach addressed the relationship between school-related stress and SOC and the possible moderating effect of SOC on school stress and psychosomatic complaints in adolescents (Moksnes et al., 2010; Torsheim, Aaroe and Wold, 2001). Studies endorsing the second approach supported the positive effects of teacher and student support on SOC (Bowen et al., 1998). Both approaches were considered in studies that more extensively analysed the relationship between school and SOC (Natvig et al., 2006).

In addition, other works analysed the relationships between specific variables from the school context and SOC (Dorri et al., 2010; Kristensson and Öhlund, 2005; Madarasova-Geckova et al., 2010).

In conclusion, research suggests a close relationship between school and SOC in adolescence. Particularly, SOC was found to be negatively associated with the level of perceived pressure due to schoolwork (Natvig et al., 2006; Torsheim et al., 2001) and positively associated with academic achievement (Dorri et al., 2010; Kristensson and Öhlund, 2005) and academic aspirations(Madarasova-Geckova et al., 2010). In addition, support from classmates (Natvig et al., 2006) and teachers (Bowen et al., 1998) was positively associated with the development of SOC in adolescence.

Peer group

The relationship between experiences within the peer group and adolescent SOC has received much less attention (included in only 2.94% of the reviewed studies). In fact, only two studies involved variables related to the peer group (Evans et al., 2010; Moksnes et al., 2010).

Nevertheless, that existing research provided interesting findings. For example, Moksnes et al. (2010) found that pressure from the peer group, similar to stressors from other contexts, had a negative effect on adolescent SOC. Evans et al. (2010) concluded that the peer group can be a source of protection or risk. Specifically, support from peers appeared to promote SOC, whereas gun use and positive attitudes towards drug consumption in the peer group were associated with lower SOC levels in adolescents.

Neighbourhood

An analysis of the relationship between SOC and neighbourhood variables was included in 5 out of the 68 studies. Despite the scarcity of research on this topic, the existing evidence

supports the significance of neighbourhood in adolescents' developing SOC. For example, a positive association has been found between SOC and the informal control over adolescent behaviour exerted by neighbours (Nash, 2002). Additionally, neighbourhood cohesion and perceived social support appeared to have positive effects on SOC (Marsh et al., 2007). In contrast, living in nomadic communities or the lack of housing stability (Antonovsky & Sagy, 1986), being exposed to violent or vandalistic situations (Koposov, Ruchkin and Eisemann, 2003), and the presence of criminal gangs in the neighbourhood (Marsh et al., 2007) were associated with a low SOC.

Conclusions

This systematic review integrates the research findings on SOC in adolescence to date. By doing so, our review offers valuable scientific information about SOC during this developmental stage. This information includes interesting findings about the influence of variables related to demographic background and the main developmental contexts in adolescence. Additionally, to inform the design of future research, our review highlights issues related to methodology, such as the type of samples or the reliability of the different versions of the SOC Scale for adolescent samples.

Through the present review, we seek to provide a useful guide and starting point for future research on SOC in adolescence and to allow greater depth and more systematic and rigorous methods. For this purpose, much effort was made in the publication search process and the subsequent analysis. Specifically, based on the total of 1458 publications on SOC and salutogenesis originally identified, we applied a set of inclusion and exclusion criteria to narrow

them down to the final set of 68 research studies on adolescent SOC. In addition, a standardised form, which included the fundamental aspects of analysis, was completed for every study. Dividing studies by the age of the sample and calculating effect sizes to clarify inconsistent findings regarding gender differences in SOC constituted another strength of this work.

Based on the procedure described earlier, the review produced interesting findings in four separate aspects, including the adolescent sample studied, versions of the SOC Scale and their reliability, the influence of gender and age on SOC development, and the analysis of influences from different developmental contexts.

First, results show that researchers studying SOC in adolescence have made important attempts to collect their data across a wide range of representative samples, given that most of the studies used samples of more than 500 participants. In addition, an analysis of sample type indicated that the majority of studies were conducted on normative adolescents. However, some studies were devoted to specific samples, such as clinical or special populations (e.g. Blom et al., 2010; Gustafsson et al., 2010).

In terms of the instruments for assessing SOC, our analysis showed that the original scale (SOC-29) and the 13-item adaptations (SOC-13 and SOC-13-HBSC) had the highest levels of reliability (with average values of Cronbach's alpha exceeding 0.80). Other versions (FSOC, CSOC, SOSC, and *ad-hoc* adaptations) showed more modest levels of reliability and were used less frequently. Thus, the results indicate that, among the currently available versions of the SOC scale, the SOC-29 and the SOC-13 may be the most appropriate for the study of adolescent samples. However, given the wide variety of available instruments and the fact that research on

adolescent SOC is relatively new, research on the psychometric properties of the SOC scales is still lacking. Therefore, further work is needed to validate different versions of the SOC scale in adolescent samples.

With respect to the influence of gender and age in SOC development in adolescence, we sought to clarify the contradictory findings on the influence of gender by estimating effect size and combining the analyses of gender and age. Both strategies proved to be helpful. Whereas no gender differences were found in adolescents younger than 15 years of age, most of the studies involving older adolescents reported higher levels of SOC in boys. As for the influence of age, only one longitudinal study was available, and the findings from cross-sectional work were contradictory, which was likely due to the differences in the age ranges studied. Thus, it is important to conduct longitudinal studies that examine the influence of age on SOC throughout the entire period of adolescence, which may shed light on the developmental process of SOC during adolescence.

Finally, our effort to identify contextual factors that facilitate or inhibit the development of a strong SOC is in line with the idea that health is nurtured in daily life experiences and in the contexts in which everyday life takes place (WHO, 1986). Despite the strong agreement on the need to consider socialisation contexts when studying adolescent development (Steinberg, 2002), this review revealed that there has been little research attention on developmental contexts as potential sources of relevant experiences for SOC development.

In addition, not only does the relationship between developmental contexts and SOC remain relatively unexplored, but different contexts have received unequal attention with regard to their

roles. Specifically, family and school have been the most frequently studied contexts, whereas the peer group and the neighbourhood have typically been neglected.

Nevertheless, the reviewed studies support the importance of experiences within the family, the school, the peer group and the neighbourhood in shaping adolescent SOC. Therefore, studies looking at key development contexts in adolescence are needed to identify influential variables in the development of SOC.

Finally, results from this review highlight the need for a more detailed understanding of the influence of different developmental contexts on SOC development in adolescence. In the case of family and school, given that the influence of specific dimensions has already been established, the next steps should involve more ambitious studies that adopt a wider focus and analyse a greater number of relevant dimensions. As for the peer group and the neighbourhood, more research is needed given the scarcity of studies to date. Furthermore, given that adolescence is a developmental stage in which everyday life contexts expand and diversify, future research should include integrative analysis that considers more than one context and explores the interactions between contexts. An integrative approach is needed to accomplish a deeper, more comprehensive and more realistic understanding of adolescent development.

This work represents the first effort to date to conduct a systematic review of the research on SOC in adolescence. This is a necessary undertaking in terms of organising and integrating the body of knowledge on this topic, and of directing research to areas that have not been explored as extensively. In conclusion, this review contributes not only through providing answers to important questions but also through generating a wide range of new research questions. Thus,

our review is both a straightforward and revealing summary of the current state of the research on SOC in adolescence and a guide that points to possible directions for future research.

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Table 1. *Versions of the SOC Scale and reliability in adolescent samples*

		Reliability (Cronbach's alpha values)		
	f	**Mean**	**Range**	**Level**
SOC-29	11	.87	.81-.94	Good
SOC-13	37	.82	.55-.87	Good
SOC-13 HBSC	3	.81	.72-.85	Good
CSOC	3	.72	.71-.72	Acceptable
FSOC	4	.79	.76-.81	Acceptable
SCHOOL SOC	3	.65	.64-.66	Questionable
OTHERS	9	.70	.61-.80	Questionable

Note: More than one version of the SOC scale were used in some of the studies. The version of the questionnaire was not reported in one of the studies, and not all studies reported Cronbach's alpha. Consequently, the mean reliability values were calculated based on a reduced number of studies.

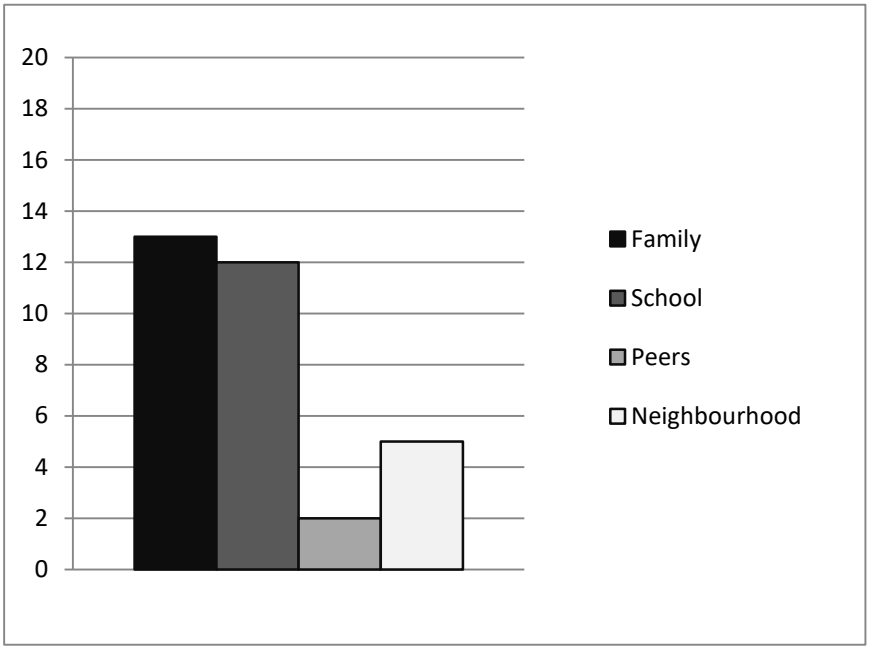

Figure 1. Developmental contexts analysed in studies on SOC in adolescence