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TESI DOCTORAL

Títol Empirical approach to the effect of social capital on the lifestyle, eating habits and weight status of a sample of Catalan adolescents. A specific focus on the family environment in different socioeconomic contexts.

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Abstract

Social capital, described as the resources that can be accessed thanks to the membership in groups or networks, has been recognized as social determinant of health. However, its effect has been little investigated in relation to obesity and its health related behaviors and in adolescent population. The pathways through which it influences different health outcomes are not sufficiently described. Furthermore, one glaring gap in the social capital related literature is the family domain. Thus, the overall aim of this dissertation is to investigate the potential effect of social capital on the lifestyle, eating habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts, with a specific focus on the family environment. Results show that the different constructs of social capital act separately and have allowed to characterize some of the several mechanisms through which they influence lifestyle and health behaviors in adolescents. In the framework of this research, higher levels of social capital in the family domain are the most protective factor for the health outcomes included in this investigation, and its influence on health outplace socioeconomic status as the main social predictor of health in our study. Further research should contribute to refine the role of social capital in different domains, especially the family context, as a social determinant of health in adolescents and in relation to other determinants of health.

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Introduction

1. Motivation and theoretical justification of the research

I started thinking about what to write in this section in July 2014, after an intense meeting with my thesis director. At that moment, it was certainly difficult to foresee how to weave a good discourse that summarized and communicated the multifarious evolution of my education, because if there is one word that can be used to accurately describe it, it is *unconventional:* I graduated in Human Nutrition and Dietetics, obtained my Masters in Social Pedagogy and I am currently pursuing a Doctorate degree in Education with research stays in a School of Public Health. This diversity of disciplines was laid bare every time someone asked me what I did do for a living or what I was investigating, and it was not very clear for me how to approach my answer. Sometimes, however, as Steve Jobs[1] once said "*dots can only be connected backwards. So you have to trust that the dots will somehow connect in your future. You have to trust in something: your gut, destiny, life,* karma… *whatever. Because believing that the dots will connect down the road will give you the confidence to follow your heart, even when it leads you off the well-worn path".* This sentence has two relevant parts for my exposition: the fact that dots can only be connected backwards, and the need to trust that the dots will somehow connect in the future.

For me, the moment of connecting the dots was the presentation of the second edition of the book "Social Epidemiology" by Lisa Berkman, Ichiro Kawachi and Maria Glymour,-a cornerstone textbook in the scientific research concerned about how social factors influence health, to which I had the opportunity to attend during my second stay at the Harvard T. H. Chan School of Public Health. What I witnessed there was, in fact, a reminder of what I had soaked up during my formative process at the research group ***P**edagogia, **S**ocietat i **I**nnovació amb el support de les **TIC*** (PSITIC), but replacing the word "education", by the word "health". The presentation of this textbook, as the book itself, was an invitation to widen the scope we use to look at health and wellbeing, and to consider the social sphere as a main character in shaping individual and

[1] Steve Jobs, Stanford Commencement Adress, 2005.

group's health and behavior. In my particular case, this invitation was a second reminder: in this occasion, of the reasons why I chose this *singular* path.

Back in grad school, when I was learning how to promote people's health and tackle some of the most prevalent non-communicable diseases such as hypertension, hypercholesterolemia, obesity, cardiovascular disease or type 2 diabetes through healthy eating, my biggest concern was how to *effectively* help people to change their habits and behaviors. Nowadays, obesity holds a prominent position in the nutrition-related epidemiology, due to the alarming increase of the rates and the severity of the associated co-morbidity worldwide. According to the World Health Organization (WHO), more than 1.4 billion adults older than twenty have a Body Mass Index (BMI) greater than 25kg/m^2, 500 million of whom are clinically obese, as indicated by a BMI higher than 30kg/m^2 (WHO, 2014c). This tendency is also true for children and teenagers, for whom the prevalence of excess weight (BMI>25kg/m^2) has increased by 47,1% between 1980 and 2013 (Ng et al., 2014), impairing their health as youth and future adults.

Nonetheless, at that time, in our context obesity was not such a big of a concern as it is nowadays. The fact that neither the word "obesity" nor "overweight" appear in the report providing the results of the Health Survey of Catalonia 2002 (ESCA, from its Catalan initials), shows the novelty of obesity as a focus in Public Health in Catalonia during the last decade (Generalitat de Catalunya. Departament de Sanitat i Seguretat Social, 2003). At the same time, however, the results of the two first waves of the Catalan Nutritional Survey 1992-93 and 2002-2003 (ENCAT, from its initials in Catalan) revealed that the consumption of vegetables, fruit, pulses and fish had diminished while the intake of dairy products, processed products and fast food, as well as obesity prevalence, increased (Serra-Majem et al., 2007).

The thing is that obesity is only the tip of the iceberg and reflects the consequences of unhealthy lifestyles. Back in 1991, Dahlgren and Whitehead published a study in which lifestyle was presented as being responsible for more than half of the state-of-health (Whitehead & Dahlgren, 1991). Current estimates are that by 2020, nearly two-thirds of the burden of disease will be attributable to non-communicable diseases, most of them strongly associated with diet and physical activity (WHO, 2002). As a nutritionist, my concern about unhealthy lifestyles goes far beyond BMI: proper nutrition is essential for health and wellbeing, whether or not we may need or feel the desire to control our weight. Even if we remain thin, unhealthy eating has vast consequences on our quality of life, and stressing too much the need to eat well *only* to prevent

excess weight promotes unhealthy diets and unhealthy attitudes and behaviors towards food, health and physical appearance (Neumark-Sztainer, 2012; Portela de Santana, da Costa Ribeiro Junior, Mora Giral, & Raich, 2012).

Hence, my concern was most likely the result of the increasing distance between healthy eating recommendations (in our context, embedded into the Mediterranean Diet pattern) and people's actual diet, and of the incipient worrying trends about obesity. Somehow, I intuited that tackling these challenges needed a more comprehensive, multidisciplinary and holistic approach, and with this idea in mind, my first attempt once I finished my Nutrition degree was to take a Master in Educational Psychology to deepen my understanding of human behavior. However, l*ife, karma…* or what my director would call "the hand that opens the doors" intervened here, and I was not admitted in the program because I came from a 3-year bachelor and lacked 60 credits to be allowed to sign up. As a counter-proposal, I was recommended to take a Master in Social Pedagogy as a *bridge* course, which I enrolled in, and it turned out that it provided me with an excellent framework to begin to understand the impact that environmental and social factors actually have in shaping eating behaviors –and what we can, as different *social agents*, do to improve them. I never went back to the Educational Psychology path, and continued my academic development at the PSITIC research group, applying the networked approach that they have been developing for twenty years in the field of education, to health.

As mentioned above, we are now beginning to understand that these health-damaging lifestyles such as energy overconsumption or physical inactivity are influenced by multilevel environmental factors which, together, have been referred to as the *obesogenic environment* (Egger & Swinburn, 1997). A recent study published in the bulletin of the WHO suggested that the increase in food energy supplies can, by itself, explain the rise in average population body weight, especially in high-income countries (Vandevijvere, Chow, Hall, Umali, & Swinburn, 2015). We know, too, that certain living conditions have a particularly damaging effect on the likelihood of developing excess weight, as in the case of low income and low educational background, making individuals under these conditions more vulnerable to overweight and obesity (Robertson et al., 2007)

An upstream approach to this situation entails, on the one hand, addressing these furthest determinants such as the increase in food availability or the socioeconomic status (SES), but, on the other, it also requires an increased comprehension of the intermediate factors that mediate

the relationship between these upstream features and health outcomes. If we are to unravel the mechanisms through which social factors are driving obesity prevalence, it is necessary to understand, first, its effects on the related intermediate behaviors. Green and Tones (1999) wrote about the challenges to evaluate community programs addressed to improving health due to the different timing of progress for the different actions: each intervention generates a series of events with different results that provide different indicators. In other words, it means that the ultimate effect of an intervention may not be noticeable until decades later, and, thus, may have been exposed to a large number of influences; so when it comes to their evaluation it is difficult to establish cause-effect relationships, but on the other hand, they produce midway effects that can be measured over time. This is also true for observational studies: some characteristics may have not an effect on the ultimate outcome we are interested in, but it is affecting other steps of the process, so it is necessary to understand them in order to be able to develop an effective response.

Back to the case of obesity, an important body of research has tried to explain how social factors influence body weight. For example, there is a clear socioeconomic gradient in the prevalence of excess weight: in Europe, 26% of obesity prevalence in men and 44% of women's prevalence is attributable to differences in this parameter (European Union, 2013; Robertson et al., 2007). However, although it is known that the cost of a healthy diet and stress-related factors might mediate this relationship, we have a lack of systematic comprehension around the pathways through which this gradient actually happens.

An additional, relatively new concept in the study of the social determinants of obesity is social capital. Broadly, social capital can be described as the resources that can be accessed thanks to the membership in groups or networks. I do not remember when or where did I hear the notion of social capital for the first time. What I remember is that, once I did, my interest and eagerness to study social capital and its relation to health and dietary habits become central: the more I knew, the more questions I had. So much so, that I changed my original (and approved) research proposal of investigating Barcelona's childhood obesity prevention actions from a social and networked point of view, to a totally new idea of approaching the effect of social capital on obesity, lifestyle and eating habits in teenagers.

The reasons behind this change were the questions that scientific literature posed itself. There is extensive evidence of the relationship between social capital and health. Several studies have

found associations between self-rated health (Kawachi, Kennedy, & Glass, 1999), mental health (Harpham, Grant, & Rodriguez, 2004), cancer (Lynch et al., 2001) and cardiovascular risk (Sundquist, Johansson, Yang, & Sundquist, 2006); associations with obesity are now beginning to be further explored. Nevertheless, multiple questions remain still open: does social capital also affect health in children and adolescents? What are the mechanisms through which this association happen? Are the different dimensions of social capital equally related to obesity? Is there a relationship between social capital and lifestyle and dietary habits, or does the association between social capital and obesity in adolescents happen through other pathways? Is social capital from different sources (i.e.: family, school, neighborhood...) equally associated to obesity and the above mentioned related behaviors? What is the relationship between social capital and other social determinants of obesity in adolescents?

This research arose with the aim of bring some answers to these questions with the purpose of gathering evidence that can contribute, in the future, to the design and implementation of actions that can effectively promote healthy eating, healthy lifestyles and better health among adolescents.

2. Formulation of the research problem

Obesity has already been described by the WHO and World Obesity/Policy & Prevention (formerly the International Task Force - IOTF) as the 21th century epidemic because of its high prevalence, its impact on morbidity and quality of life, and its associated high economic costs (WHO, 2000).

As a response, the development and implementation of preventive actions to reduce the prevalence of obesity has become a priority in most public health agendas. Research on obesity prevention also illustrates this trend: a quick search on PubMed[2] with the words "obesity prevention" yield close to 35,000 references, with a ratio of publications per year that has evolved from less than 300 in the mid-nineties to 3,500 in the last two years. The amount of papers published has not been the only change. There has also been a noticeable shift in approaching how to tackle this health issue. During the first decades of research, the focus was on specific nutrients intake, its relation to other diseases such as cardiovascular disease, hypertension or diabetes and behavioral interventions at the individual level. From the late-nineties an important body of research has moved towards the so called "ecological approach" to the obesity pandemic (see Egger & Swinburn, 1997; Gortmaker et al., 2011; Huang & Glass, 2008; Kumanyika, Libman, & Garcia, 2013; Labonte, Feather, & Hills, 1999; Luque, 2008; Ohri-Vachaspati et al., 2014, among many others).

This approach reflects a better comprehension of the etiology of obesity and acknowledges that the imbalance between energy intake and expenditure that eventually leads to an increase in adiposity is the result of a complex interrelationship of biological, behavioral and environmental factors, also referred to as the social determinants of obesity (Hu, 2008; Kumanyika et al., 2013).

The main rationale behind this shift is based on the speed and intensity with which the variations in the prevalence and social pattern of obesity witnessed over the past decades have happened. Since, at a population level, environmental causes bring much more rapid modifications than genetic alterations, the marked rise in obesity has been suggested to mirror changes in the environment and the way we live, rather than genetic causes.

[2] Search conducted in July 2015.

Market globalization, economic growth and the influence of publicity and mass media have been identified to be drivers of individual and group behaviors, whose effects are modulated by different factors at the regional, national and local level (James et al., 2004). Beyond these and other elements at the macro level, closer aspects such as the housing and working conditions, the fact of living in a rural or urban environment, or social support have also a great impact in people's health (Berkman, Kawachi, & Glymour, 2014; Ng et al., 2014).

Hence, obesity inequalities can be understood as the result of multiple risk factors interacting with other determinants placed at the micro-, meso- and macroenvironment, according to which these individuals placed at the lowest part of the socioeconomic scale are more likely to be exposed to environments that combine unhealthy diet, reduced physical activity, lower self-esteem and a more difficult access to health and social services and/or other forms of social support (European Communities, 2003; Robertson et al., 2007).

There is a wide consensus to consider socioeconomic factors as major determinants of health and mortality. The concept "socioeconomic level" is used in very diverse contexts, sometimes referring to social class, sometimes to social condition or the position in a social hierarchy, and, most often, to different indicators such as income, education level, environmental characteristics, social support or occupation (Berkman et al., 2014). All of them are closely related to health, but the patterns are different for each one and for each health condition (Pearce & Witten, 2012).

In the particular case of obesity, gender, income and educational level are specially relevant, and they also condition other factors through different mechanisms (Robertson et al., 2007). The FAIR project examined food intake in 15 European countries and observed that low-income adults showed less healthy eating behaviors. More specifically, a difficulty to access quality foods at a low price was a real hazard in the households with lowest incomes, despite the fact that food expenditure constituted a very high percentage of their monthly expenses. It was also observed that nutritional information reached these low-income households, but their needs were conditioned by physical and financial constraints, as well as by psychosocial limitations (De Irala-Estévez et al., 2000; Roos et al., 2012).

Costa-Font & Gil (2008), examined the existence of obesity inequalities in Spain and concluded that even if there are inequalities due to income differences, the educational level was the main factor that explained adult obesity inequalities in this context. In the case of children, the same

authors found parental influences – as the effect of parental income level, parental education level and maternal employment- influence children BMI, probably through the failure of parents to look after their children's health due to their own conflicts, the costs of parenting or the intergenerational transmission of attitudes towards food and lifestyles (Costa-Font & Gil, 2013). Previous data from the enKid study (1998-2000) reported maternal education level to be the most important predictor of diet quality (Aranceta, Pérez-Rodrigo, Ribas, & Serra-Majem, 2003b).

A contextual factor plausible but little investigated as a social determinant of obesity and inequalities generator is social capital (Kim et al., 2006). There is, however, a large body of science around social capital and health in general since the concept appeared for the first time in the public health literature in 1996. The relationship is complex and some authors have been critical with this association, because of the limited conceptualization of the construct social capital, the ideological assumptions behind it and the query of whether social capital can actually explain health (Moore, Haines, Hawe, et al, 2006; Kawachi, Subramanian & Kim, 2008). However, multiple studies have linked different elements of social capital with various benefits for health, and even the review led by Michael Marmot *Fair Society, Healthy Lives* (2010) recommends the promotion of social capital as a policy likely to reduce inequalities and promote health and wellness.

One of the main criticisms of social capital is the lack of agreement on its conceptualization. There are multiple definitions of social capital, which mainly stem from the theories of the three authors classically identified as fathers of the concept: Bourdieu, Coleman and Putnam. All of them recognize elements such as social trust, norms and networks to which people can resort to solve common problems, and there is a great consensus in considering a structural and a cognitive-attitudinal dimension. The first involves being part of social networks, associations and/or other forms of civic engagement while the second refers to the perceived level of trust and reciprocity through shared norms, values and attitudes (Baum & Ziersch, 2003; Harpman, Grant & Rodriguez, 2004; Krishna & Hader, 2002; Subramanian, Kim & Kawachi, 2002). This distinction is not minor; since some studies that have separated these two dimensions have seen that their effect on health is not the same. This is the case of a study conducted by Harpham et al (2004) in which social capital was related to mental health in Colombia. The results of this study showed that while the cognitive-attitudinal dimension of social capital was related to mental health, the structural dimension was not. A research on

trust, participation and obesity associated high levels of trust with a reduction in the probability of suffering obesity (Engstrom, Mattson, Jaerleborg et al., 2008). In another study, citizen participation was associated with a lower likelihood of having BMIs above 27kg/m^2 (Veenstra, Luginaah, Wakefield et al., 2005). The results were similar in a research with adolescents conducted by Evans & Kutcher (2011), in which social capital was measured based on community cohesion, social control and relationships of these teenagers to adults in their community.

Also the measure of social capital from a social network approach has been associated with a decrease in the likelihood to present overweight and obesity, both in terms of BMI and waist circumference (Spencer Moore, Daniel, Paquet, Dubé, & Gauvin, 2009). On the other hand, Christakis & Fowler (2007) observed that, in a tightly interconnected network of more than 12,000 people, being connected to someone that became obese during a certain period of time increased the probability of being obese up to three degrees of separation. These relationships were not observed in same-zone neighbors, which reinforces the relevance of social connections beyond other geographical aspects.

There is still little evidence to determine what effect social capital has on obesity. Several issues remain open, such as what the mechanisms are, enabling this benefit to occur, what the role of social capital as a determinant of food intake is (so far the relationship with obesity has been measured as BMI or waist circumference, without assessing dietary intake) or associations or synergies that affect relationship obesity-social capital. Besides, this is an unexplored relationship in children and teenagers, which opens an interesting possibility for research, because if the potential beneficial effects that are attributed to social capital in adulthood were confirmed for the child population, this would be a new element upon which to act to reverse the upward trend in the prevalence of obesity among the young.

A call for action on counteracting childhood and adolescent obesity has been made from several establishments. In fact, not only to prevent weight excess, but to promote overall heath, because even if children tend to exhibit less clear health problems than adults, they engage in activities and behaviors that have significant implications for their health and well-being. Adolescence has been referred to as the “last best chance” to prevent adult non-communicable diseases (NCDs) (Patton et al., 2012a). The reasons are, on the one hand, the fact that the earlier some risk factors appear the greater the impact that they are going to have on future health and, on the other, the perpetuation that the habits acquired during adolescence will have on

the future adult behavior and the difficulty to change strongly established habits and revert NCDs. For example, it is well known that 60% of the children who are overweight before puberty will be overweight in early adulthood (WHO, 2015a), or that the harmful use alcohol during adolescence is the risk factor with the largest impact on disability-adjusted life-years (DALYs), accounting for 7% of DALYs worldwide (Popkin, Adair, & Ng, 2012). Adolescence is a very unique and critical period on a person's development, in which important physical, social and cognitive changes that can affect health take place. Thus, understanding the influence that the social environment specifically has on youth health is a priority to foster healthier communities in the next generations.

A more active focus on youth has been claimed not only from the field of obesity prevention related research, but also from the study of social capital. Authors like Morrow (1999) or White (2008) have emphasized the need to give an active voice to children and teenagers in the study of social capital, who very often are assumed to have a passive role as a mere receptors of social capital, despite the well-known importance of social relationships at these ages (Jenkins & Horner, 2005; Patrick & Nicklas, 2005). Furthermore, if social environment is to be considered relevant for adolescent health, a multi-site approach needs to be taken into account.

Hence, the research we present aims to provide knowledge about how social factors, particularly social capital, influence lifestyle and diet-related behaviors, which should propel the development of socio-educative practices that, along with aspects of basic nutrition, dietetics, physical activity and other disciplines, may contribute to the promotion of adolescence health.

3. Research questions and objectives

With the intention to define and delimit the research, below are the critical questions that guide our investigation and to which we aim to respond at the end of this work. Following Del Rincón, Arnal, Latorre, & Sans (1995), and given the descriptive and interpretative nature of our research in which the approach to the study problem is motivated by the purpose to comprehend the phenomenon rather than by the will of testing and demonstrating an hypothesis, we choose to present our inquiries in the form of research questions.

The main research question of our study is:

- How is social capital related to the lifestyle, dietary habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts?

Which can be concretized in the following secondary research questions:

- What are the lifestyle, dietary habits, weight status and social capital of a sample of Catalan adolescents from different socioeconomic contexts?
- Does social capital in the family, peers, community and school domains are differently associated to the lifestyle, dietary habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts?
- Do the different dimensions of social capital in the different domains have are differently associated to the lifestyle, dietary habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts?
- Are there other relevant variables that may influence the lifestyle, dietary habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts?

To provide answers to these questions, we set the following research objectives. Objective 1 and its sub-objectives will be addressed through a bibliographic review, while empirical work will be used to achieve objective 3 and its sub-objectives. Objective 2 combines both strategies.

1. To establish a theoretical framework for the comprehension and conceptualization of the relationship between social capital and other social determinants of health, and lifestyle, dietary habits and weight status.
    1.1. To review the evidence around the effect of social capital from different sources (family, peers, school, community) on lifestyle, dietary habits and weight status.
    1.2. To review the evidence around the relationship between the different dimensions of social capital (structural, cognitive, bonding, bridging) and lifestyle, dietary habits and weight status.
    1.3. To examine the different approaches, instruments and techniques used to measure social capital in health sciences, in order to choose those most appropriate for our research.
    1.4. To concretize the former theoretical framework to the specific case of adolescence.

2. To develop and validate a questionnaire to assess family social capital in adolescents.

3. To study the effect of social capital on the lifestyle, dietary habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts.
    2.1. To study the lifestyle, dietary habits, weight status and social capital in a sample of Catalan adolescents from different socioeconomic contexts.
    2.2. To deepen in the association of the different aspects of family social capital and the lifestyle, dietary habits and weight status in a sample of Catalan adolescents from different socioeconomic contexts.
    2.3. To outline a framework of the relationship of the different dimensions of social capital and the lifestyle, dietary habits and weight status in a sample of Catalan adolescents from different socioeconomic contexts.
    2.4. To identify other possible relevant variables susceptible of influencing the lifestyle, dietary habits and weight status in a sample of Catalan adolescents from different socioeconomic contexts.

4. Epistemology and methodology

Following Kuhn's definition of paradigm (1971), understood as the different attitudes, beliefs and commitments undertaken by a scientific community, which guide the perception and comprehension of reality and upon which the epistemological and methodological bases of the research are built, we place ourselves in an interpretative paradigm (Lincoln & Guba, 1985). This paradigm posits that realities are multiple, holistic and built from intersubjective experience and, thus, it assumes that the comprehension of social phenomena happens through the meaning that individuals and groups give to them, bestowing a central and active role to subjective experience (Elliot & Timulak, 2005).

Therefore, we aim to understand adolescents' lifestyle and dietary habits in the situations and context that *naturally* occur, studying the relationships between the different social and environmental variables that intervene and the characteristics of the individuals and groups inscribed in the reality that we investigate (Caride & Trillo, 1983).

As a researchers, we assume an emic and participative position, from which we aim to reach a holistic and systemic vision of the phenomenon of study by describing, analyzing and interpreting our data. Hence, in agreement with the complex nature of our object of study, we approach this research from a mixed methods perspective which integrates different methodologies and techniques and includes the use of observational and analytic categories that arise from the object of study itself, as well as from the triangulation of the different observations made. The central premise of mixed method research is that "the use of quantitative and qualitative approaches in combination provides a better understanding of research problems that either approach alone" (Creswell & Piano Clark, 2011:5).

This study began with a thorough bibliographic search in order to constitute the theoretical background of the research and orientate the field work, according to which we planned a mixed-methods research based on two concurrent studies from which to draw our conclusions. On the one hand, we conduct a multiple-case study using interviews and qualitative discourse analysis; and on the other a cross-sectional study in which we apply statistical methods. Additionally, and as a response to other of the research needs detected in the literature review, we developed and validated a questionnaire to measure family social capital through a process that uses, again, both, qualitative and quantitative approaches.

5. Structure and Organization of the dissertation

This dissertation is structured as follows:

In the first section of this dissertation we discuss the theoretical background of this study, with regard to obesity, social capital and adolescence. In this part, we describe international and national trends of obesity and discuss its etiology from an ecological approach. We also elaborate on the conceptualization and measurement of social capital in health sciences, as well as review the evidence on its role as a social determinant of health. The relevance of social capital in the family context and its influence in health is discussed in depth. Last, we concretize this theoretical framework to the specific case of adolescence.

The second part of this dissertation describes the methods used in the empiric work, which consists of a mixed-methods research based on two concurrent studies with a cross-sectional and a multiple cases design. Previously, we present the elaboration and validation of a questionnaire to assess family social capital in adolescents.

Next, the results of the elaboration and validation of the family social capital questionnaire and of the two studies are presented. In the subsequent section they are discussed in relation to the research questions of this dissertation.

Last, final conclusions are emphasized and possible future areas of research are indicated.

6. Ethical principles

This research is developed according to the ethical requirements provided by the Helsinki Declaration (World Medical Association, 2013) and the principles of beneficence, nonmaleficence, autonomy and justice as posed by Beauchamp & Childress (2001)**.** The general procedures of this research were approved by the Ethics Committee of the Facultat de Psicologia i Ciències de l'Educació i l'Esport Blanquerna – Universitat Ramon Llull.

All the participants in any of the phases of this study have been informed about the research objectives, as well as of the procedures that their participation entailed. The signature of the informed consent is required to participate in the study. Given that most of the participants in the study are minors, parental or legal representative consent has been collected. However, we opted for also including an informed consent form, recognizing both the respect to their vulnerability and autonomy (Ruiz-Canela et al., 2013). These documents described the procedures of the research, facilitated contact information with the research team, in case there were any questions or doubts, and clearly specified that participation was voluntary and could be withdrawn at any moment if the participant wanted to do so.

With the aim of guaranteeing data confidentiality only the research team had access to the collected data and all the documents were codified and kept in separate fields in a way that it was not possible to identify participants. Research information has exclusively been used according to the study objectives and all participants will receive feedback of the results.

Theoretical background

7. The phenomenon of obesity: the top of the iceberg.

7.1. Global context

According to the World Health Organization (WHO), nearly 70% of the global burden of mortality in 2012 was attributable to non-communicable diseases (NCDs), such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes (WHO, 2014a), a figure that, in the case of developed countries, is expected to raise to close to 90% by 2030 (Nikolic,Stanciole, & Zaydman, 2011). Most of the key factors underlying the development of chronic diseases are modifiable lifestyle features closely related to diet and physical activity, which include a harmful use of alcohol, an unhealthy diet, insufficient physical activity, overweight and obesity, high blood pressure, high blood sugar and high cholesterol (WHO, 2014a).

Overweight and obesity have been estimated to cause between 3 and 8% of DALYs worldwide (Ng et al., 2014). In the case of European and North American adults it was assessed to cause between 8 and 15% of DALYs (WHO, 2002). High Body Mass Index (BMI) –the most used indicator to assess obesity- is a major risk factor for heart diseases, type 2 diabetes and certain sorts of cancer, including colorectal, kidney or esophageal. In 2010, diet and physical inactivity-related risk factors accounted for 10% of global DALYs (Lim et al., 2012). In the WHO European Region, overweight and obesity are responsible for more than one million deaths and 12 million years of ill health (James et al., 2004). In children, overweight and obesity are associated with significant reductions in quality of life and a greater likelihood of being teased and socially isolated (Lobstein, Baur, & Uauy, 2004; Tsiros et al., 2009; Williams, Wake, Hesketh, Maher, & Waters, 2005).

Epidemiological studies reveal that more than 1.4 billion adults older than 20 years old of age are overweight worldwide, 500 million of which are clinically obese (WHO, 2014c). In the European countries, the prevalence of obesity has increased ten-fold since the 1970s (WHO, 2007b), and three-fold since the 1980s. Although some countries begin to exhibit signs of stabilization of data, obesity prevalence is far from decreasing worldwide.

Spanish adults also show considerably high rates of excess weight: prevalence of excess weight has been estimated to be at 62%, 39% being overweight [BMI 25-29,9kg/m^2], and 23% obese [BMI ≥ 30kg/m^2], and those living in southern regions such as Andalucia or the Canarian Islands exhibit even higher rates. (Gutiérrez-Fisac et al., 2012). On the contrary, north-eastern areas like Catalonia seem to have slightly better figures. According to the last Health Survey of Catalonia, ESCA from its Catalan initials (Enquesta de Salut de Catalunya) conducted in 2014, 33.1% of 18-74 years old are overweight, while 15.0% are obese. Overweight seems to be more prevalent in men than women (40.4% vs 25.7%), whereas the percentage of obesity is similar in both genders (Departament de Salut, 2015).

This tendency is not exclusive to adults; it is a reality for children as well: worldwide, excess weight has increased 47.1% between 1980 and 2013 (Ng et al., 2014). According to the WHO's Childhood Obesity Surveillance Initiative (COSI), around 1 in 3 children aged 6-9 years old in Europe were overweight or obese in 2010 (Wijnhoven et al., 2014). Spain is placed among the European countries with the highest rates of weight excess in children, varying from 30 to 45% depending on the source and the methodology used (AESAN, 2014; Ortega, 2013; Serra Majem et al., 2003). In Catalonia, 30.4% of children aged 6-12 are overweight or obese (Departament de Salut., 2015).

Specific studies on adolescents tend to be scarcer. However, in the last decade more attention has been devoted to this target because of the relevance of the effects of health behaviors and health status in the future. In Spain, the AVENA study, conducted during the years 2000-2002 on a sample of 2,320 adolescents aged 13 to 18.5, the overweight and obesity prevalence was estimated to be 25.69% and 19.13%, respectively (Moreno et al., 2005). More recently, Sánchez-Cruz and colleagues found, using direct weight and height measures, excess weight on 25.5% of the sub-sample aged 14-17 years-old (Sánchez-Cruz, Jiménez-Moleón, Fernández-Quesada, & Sánchez, 2013). The most recent data from Catalonia yielded similar but slightly better results, with a prevalence of overweight and obesity of 22.2% in 10-17 years-old youth (Departament de Salut, 2015).

All the above mentioned surveys, studies and reports support a broader body of literature that highlight the higher prevalence of excess weight in lower social classes and among individuals with low educational level, revealing a social pattern of inequalities in the distribution of obesity (Crawford, Jeffery, Ball, & Brug, 2010; Frederick, Snellman, & Putnam, 2014; Hu, 2008; Pearce &

Witten, 2012; Robertson et al., 2007; WHO, 2014b). A significant proportion of the premature mortality and healthy years lost in lower socioeconomic groups can be explained by diseases associated with obesity, and individuals in these groups are estimated to be two times more likely to suffer obesity (Robertson et al., 2007; WHO Regional Office Europe, 2013). Thus, and in agreement with Costa-Font & Gil (2008), a better understanding of the socio-economic forces lying behind obesity is fundamental to adequately implement preventive policies.

7.2. Understanding obesity

Ultimately, obesity is consequence of an imbalance between energy intake and energy expenditure, which is stored in the adipose tissue. It is well known that, globally, there has been an increase in the intake of processed energy-dense foods along with a decrease in the practice of physical activity owed to a shift towards sedentary forms of work, transportation and increased urbanization (Fundacion Española de Nutrición, 2013; WHO, 2014a). However, this fundamental fact needs to be understood within a bigger picture. The real question here is: what are the factors behind such a sharp and steady increase in the number of individuals suffering obesity worldwide? While genetic predisposition is known to be an explanatory factor for individual weight gain, it is not plausible that it accounts for the rapid rise in prevalence witnessed over the last few decades. Instead, societal changes are more likely to have been driving the obesity epidemic, which would be the result of the interaction of a *thrifty genotype* in an *obesogenic environment* (Neel, 1962; Swinburn, Egger, & Raza, 1999).

In the first *Lancet*'s Obesity Series published in 2011, the globalization of food systems that led to overconsumption, an expectable outcome of market economies, was posed as the main factor responsible for the increasing burden of obesity. According to Swinburn et al. (2011:1), *"The global food systems drivers interact with local environmental factors to create a wide variation in obesity prevalence between populations. Within populations, the interactions between environmental and individual factors, including genetic makeup, explain variability in body size between individuals".* In other words, obesity was seen as the normal response of individuals to the obesogenic environment they find themselves in, and as a consequence, policy and regulatory actions were identified as the most cost-effective means to tackle the problem.

To date, no country has been successful at diminishing obesity prevalence, and even where a flattening on childhood obesity rates has been reported, it has come along with a widening of inequalities (Swinburn et al., 2015). In 2013, The WHO's Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020 set the modest goal of achieving a zero increase in prevalence from 2010 to 2025. However, in light of the advancement made, even this conservative aim seems challenging.

Four years after the first *Lancet* Series on obesity, a second edition under the leadership of Boyd Swinburn provides an excellent and updated framework to understand the causes, enablers and barriers to change, all of which need to be addressed to reverse current trends. It identifies further high-priority actions by overcoming some of the more established dichotomies in the phenomenon of obesity: personal versus collective responsibilities, upstream versus downstream drivers for change, treatment versus prevention, or undernutrition versus overnutrition priorities. Obesity is a complex issue, and the fact that little progress has been made between the publication of these two monographies somehow reflects the limitations of looking at obesity in terms of "either/or" (Kleinert & Horton, 2015). Rather, as previously stated, new approaches advocate reframing obesity as a consequence of the "reciprocal nature of the environment and the individual" (Roberto et al., 2015:1), which should also allow tackling socioeconomic inequalities.

The reason why a population approach that also focus on the individual level may help to narrow inequalities bring us back to Rose's seminal work on preventive medicine, first published in 1993. In this text, which was a pioneer in supporting a population approach to prevent the most common medical and behavioral disorders, he already worn about the risk that these population strategies could widen inequalities. One of Rose's arguments in this direction was, for example, that such population strategies, when they were made in the form of health education, had a greater chance of being more effective in the already well-educated and motivated groups, exacerbating existing gaps them (Rose, Khaw, & Marmot, 2008). In consequence, structural actions plus particular attention to the most disadvantaged groups and individuals may help overcome these differences.

As for the individual part, we are witnessing a time of shifts in Nutrition Sciences, with some thought-provoking questioning around some of the more established guidelines and recommendations has been gaining momentum. The Scientific report of the 2015 Dietary

Guidelines Advisory Committee (which serves as a basis to formulate the next Dietary Guidelines for the United States) is one of the most outstanding examples, in which after decades of criminalizing fats, there is an important and explicit distinction between the health effects of the different types, eggs have been re-recognized as a nutritious and economic nutrient source, at the same time that sugar-sweetened foods have been clearly identified as health-damaging. The comments of the American Academy of Nutrition and Dietetics on this report further recommend to revisit the current limitation of cholesterol and saturated fat, and fully support the recommendation to reduce the intake of added sugars (Academy of Nutrition and Dietetics, 2015).

In any case, beyond these nuances, the evidence on what works to improve individual and population health status through nutrition has never been so strong and compelling: a dietary pattern with a predominant intake of vegetables, fruits, seafood, nuts, legumes and whole grains, and a low intake of red and processed meats and foodstuff in general, sugar-sweetened foods and drinks and refined grains is health-promoting (Dietary Guidelines Advisory Commitee, 2015). While many different approaches can comply with these recommendations, the Mediterranean Diet, characteristic from our local context, holds a privileged position. The PREDIMED study has produced evidence about the benefits of this dietary pattern in relation to different health conditions such as cardiovascular disease (Eguaras et al., 2015; Martínez-González et al., 2015), metabolic syndrome (Babio et al., 2014), diabetes complications (Díaz-López et al., 2015) or even breast cancer risk (Toledo et al., 2015).

Further advancement in nutrition and how health can be promoted through diet is expected to be achieved through the development of nutrigenomics and personalized nutrition. Meanwhile, though, in order to fully implement this newly acquired nutritional evidence, motivating and promoting the adoption of healthier behaviors at the individual level is required. Dietary, physical activity and lifestyle interventions by qualified professionals play an essential role here. Nevertheless, the environment in which we live is able to facilitate or to hinder healthy behaviors, which reinforce preference and demands for specific types of food. In agreement, research is requested to theorize and empirically test the pathways through which environmental factors contribute to the rise in obesity. Environment, here, refers to “all factors that are external to the individual including the social, political, economic or biophysical spheres” (Pearce & Witten, 2012). Several conceptual frameworks have been proposed to understand environmental influences on obesity, the most well-known being the ANGELO -

ANalysis Grid for Environments Linked to Obesity- framework (Swinburn et al., 1999) or the model developed by the IOTF (Kumanyika et al., 2002). Both models share a great deal of common elements such as the food industry, media advertising or the availability and affordability of different types of food. However, the IOTF model (see Figure 1: Determinants of obesity IOTF Model.), adds a geographical dimension beyond the micro/macro difference, which enables to identify further variables upon which to act and to subsequently structure action in terms of upstream or downstream approaches.

Hence, obesity is the result of the complex interaction between global drivers and local environments which result in wide variations in obesity prevalence between populations, groups and individuals. When these variations arise from an unequal distribution of the health determinants and living conditions that create differences between the opportunities and resources that individuals and groups can access, they are referred to as health inequalities, and are defined by the WHO as unnecessary, avoidable and unjust (WHO Regional Office Europe, 1985). Obesity inequalities are particularly well documented in the case of low socioeconomic groups, and predominantly for women, which contributes to amplify health inequalities across generations, especially when obesity happens during pregnancy (WHO, 2014b).

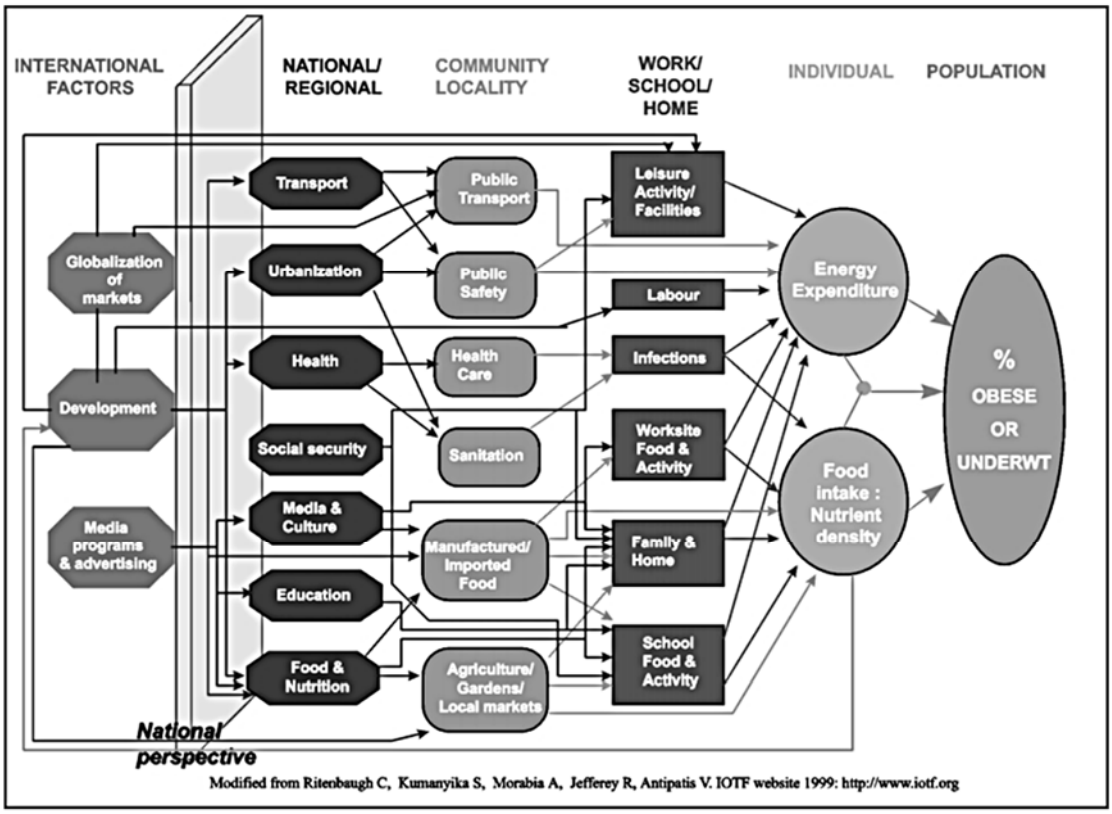

Figure 1: Determinants of obesity IOTF Model. Source: Kumanyika et al. (2002).

Socioeconomic status (SES), is typically characterized along three axis: education, occupation and income. These three dimensions are interrelated and all of them have been proven to be associated to health status, even when the mechanisms for each of them are different and some of the relationships may not be causal. Link & Phelan wrote in 1995 that SES was a fundamental determinant of health: no matter what health threads and mechanisms are relevant at any society and time given, low SES always places people "at risk of risk".

In the case of obesity, SES has been established as a mediator of the obesogenic influence that the modern-day social, physical and economic environment exercises (Costa-Font & Gil, 2008; McLaren, 2007; Robertson et al., 2007; WHO, 2014b): not only lower socioeconomic groups are more likely to be overweight but they are also becoming *heavier faster*, which in practical terms means a steeper socioeconomic gap. Besides, what data reveals is that it is not a consequence of a threshold effect of socioeconomic status (whatever indicator it is measured through). On the contrary, it appears to be a *gradient* effect by which middle class will have, in general terms, a lower BMI than low class; but higher than the wealthier (Glymour, Avendano, & Kawachi, 2014).

According to Eurostat data, the prevalence of overweight and obesity among women with a low educational level (up to lower-secondary education) was more than two-fold (and up to five-fold) higher than among highly educated women in all the countries for which socioeconomic data was available in 2008 –not every EU country had disaggregated data beyond age and gender (Eurostat, 2015). Women's greater susceptibility might be to some extent related to genetic predispositions, and also to factors such as postpartum weight retention and menopause-related weight gain. However, again, the difference of roles between genders is suggested to be the main component behind gender inequalities, for environmental pressures under which women commonly live, such as income and employment discrimination, family and budget responsibilities, fewer opportunities to practice physical activity or lower self-esteem linked to social pressure poses them at a higher risk (Robertson et al., 2007).

In a Pan-European study in which excess weight levels across different European countries was categorized according to socioeconomic status measured through household income or occupation -depending on the country, the social gradient was estimated to account for about 25% of the obesity in men and 50% in women (Martínez, Kearney, Kafatos, Paquet, & Martínez-González, 1999). Two important facts have to be kept in mind to interpret these data. First, that

BMI calculi were based on self-reported height and weight, which are likely to underestimate obesity prevalence by as much as 30% (Hattori & Sturm, 2013; Stommel & Schoenborn, 2009). Second, the fact that these results were drawn from surveys conducted in the 1990s and before, and obesity inequalities are known to have widened in the last years. In any case, these data are consistent with other studies' results such as that yielded by the WHO MONICA project, in which weight and height were professionally measured in a sample of 80,000 adults from 26 countries, 24 of which in the European Region (Molarius, Seidell, Sans, Tuomilehto, & Kuulasmaa, 2000), or the Eurothine study, published in 2007. In both cases, a relationship between lower SES measured through educational attainment and higher obesity prevalence was found (Eurothine Consortium, 2007).

However, not all the studies produce similar results, or the relationship between SES and obesity is the same in all groups. In the United States, where the biggest part of research has been conducted, there is a great difference by gender and race/ethnicity, and while SES can explain important variations in obesity trends for women, this is not so straight forward for men (Bennett, Wolin, & Duncan, 2008).

It needs to be noted that SES indicators are subject to reverse causality when linked to obesity. This is to say, the association between SES and obesity may be the result of individuals experiencing a decrease in their wealth as a result to health concerns or stigmatization for their elevated BMI (Bennett et al., 2008; Glymour et al., 2014). Race and ethnicity have been sometimes used as a proxy to SES, but while it is true that the prevalence of obesity is higher among immigrants, some findings suggest these differences are mostly related to the obesity prevalence and/or lifestyle practices in the country of emigration, and that the acculturative process that emigration entails or cultural body cannons would have a smaller (although worthwhile to be taken into account) effect. These conclusions are supported by several studies that demonstrate that, among immigrants, the longer duration of residence, the higher obesity prevalence (Goel, McCarthy, Phillips, & Wee, 2004).

Different mechanisms have been suggested to mediate the association between SES and obesity. At the micro level, there are differences in food choices and physical activity practice among socioeconomic groups. For instance, consumption of whole grains, lean meats, fish, low-fat dairy products and fresh fruit and vegetables has been consistently associated with higher SES groups, whereas the intake of processed meats, refined grains, sodium and added fats is

more frequent among individuals from lower SES groups in different developed countries (Darmon & Drewnowski, 2008; Fundacion Española de Nutrición, 2013; Nikolić et al., 2014).

The mechanisms that mediate this relationship are complex and multi-factorial. Although some products such as fish and fresh fruit and vegetables are typically perceived as more expensive, food cost is not the only determinant of food choices: low income individuals seem to show a preference for foods they are familiar with. In contrast, high income people's choices have been associated with a greater consideration of the effects of diet on health (De Irala-Estévez et al., 2000).

In addition to these, other contextual elements such as food availability, the influence of the social environment in terms of cultural habits and norms, as well as other psychosocial factors like stress, mood or self-control exercise a great influence on food choice and eating habits (Bennett et al., 2008; European Food Information Council, 2005). All things considered, diet cost becomes a critical determinant in those groups that spend a higher proportion of their budget in food (Antentas & Vivas, 2014; de Pee et al., 2010).

The same is true about the practice of physical activity, which seems to be influenced by urbanistic organization (green areas, urban density, single-use zoning, availability of pedestrian-friendly roads, etc.), safety perception and access to sports facilities that, in turn, are unequally distributed among different SES neighborhoods (Frank, Schmid, Sallis, Chapman, & Saelens, 2005; Humpel, Owen, & Leslie, 2002; Sallis, Floyd, Rodríguez, & Saelens, 2012).

The effect of contextual SES on obesity has been the object of several studies in the last decade. Mixed results have been obtained by observational studies (Frumkin, 2002; Lopez, 2004; Rooks, Xu, & Williams, 2014; Vandegrift & Yoked, 2004). However, when considering randomized controlled trials, the relationship between neighborhood SES and obesity is clearer. This is the case of a unique study in which 4,600 low-income families were recruited from five US cities to participate in a fair housing moving program. Participants were randomly assigned to three different settings: housing vouchers that could be exchanged for residence in low-poverty neighborhoods, social housing in specific -somehow deprived neighborhoods, or to a control group in which they continued receiving public housing or other housing assistance. These families were allocated between 1994 and 1998, and interim effects of the program, published in 2003, showed a substantial reduction in obesity in the first group, evidencing the contextual effect of neighborhoods (Goering, 2003).

Differences in rural or urban areas have also been highlighted. In the United States, higher prevalences in rural areas have been estimated to be at around 6 points difference, with obesity rates in rural areas being between 36.9 and 39.6% depending on the source and whether rates were based on self-reported or measured data (Befort, Nazir, & Perri, 2012; Meit et al., 2014). Some of the factors identified as contributing to rural obesity include higher poverty rates, less access to healthy and affordable food –which leads to an unhealthier diet, limited access to nutrition information and programs, including preventive and treatment services, or fewer opportunities to be physically active due to a lack of infrastructures. These differences have also been found in other countries, although not always. For example, Peytremann-Bridevaux and colleagues examined differences of overweight and obesity prevalences in rural and urban areas of 10 European countries, and found no significant differences, except in the case of Greece, where the difference was explained by SES factors (Peytremann-Bridevaux, Faeh, & Santos-Eggimann, 2007). In Spain, several national studies have found rural-urban differences in the prevalence of obesity and overweight, which also have been posited to be influenced by SES and access to health-care facilities (Cea-Calvo et al., 2007; Hernández-Mijares et al., 2009).

At a more psychosocial level, emotions and the responses that they evoke in the organism have been proposed as one of the pathways through which the social environment would influence health. In this sense, chronic stress is one of the most studied features in relation to obesity. Two mechanisms have been suggested to explain this relationship. On the one hand, food cravings –especially for highly palatable foods, rich in fat and sugar- increase under stress circumstances, in which reward mechanisms are impaired (Jastreboff et al., 2013; Schellekens, Finger, Dinan, & Cryan, 2012; Sinha & Jastreboff, 2013). On the other, chronic stress seems to promote upper body obesity through alterations in the hypothalamic-pituitary-adrenal axis, which not only promote higher adiposity, but also metabolic and inflammatory diseases (Bose, Oliván, & Laferrère, 2009; Fernández-Sánchez et al., 2011).

Identified sources of social stress include situations that are perceived as threatening and/or overwhelming to an individual's perceived ability to cope with it, such as life events that result in significant changes to his or her life, sustained struggle over time, excessively demanding roles, or conflicts between the different roles that an individual plays. A further thread associated to chronic stress is the difficulty to develop or maintain supportive social networks and /or a lack of social capital (Kubzansky, Winning, & Kawachi, 2014).

The distinction between social networks/social support and social capital is not always clear. Kawachi and Berkman (2014) center this differentiation in the quality of the ties within the network. This way, while ego-centered social support typically arises from close, and strong connections, social capital broaden this definition to also include the resources that come from weak relationships. Michael Marmot, in turn, refers to "social and psychological support as a major mechanism by which social capital might improve mental and physical health and well-being (OEDC, 2010, p. 6).

The different approaches in which social capital and social support have been linked to health and, more specifically, to obesity, are reviewed in detail in the next chapter. In any case, social capital (used here as a generic for these two forms of social features) has been linked to health inequalities in many different scenarios, including all-cause mortality (Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997), self-rated health (Kawachi et al., 1999; Rose, 2000), mental health (Harpham et al., 2004; Rose, 2000), cardiovascular disease risk (Sundquist et al., 2006), cancer (Lynch et al., 2001) and obesity (Christakis & Fowler, 2007; Holtgrave & Crosby, 2006; Moore et al., 2009), among others.

Last, age has been identified as a further determinant of obesity. In general terms, weight increases with age, but it shows to be inversely related to SES at some ages (Baum & Ruhm, 2007). Physiological processes during ageing provide part of the explanation to this increase. At the same time, SES inequalities widen over the lifecycle, most likely mediated by the cumulative effect of the different opportunities and resources to which individuals have availability and the existence of *critical stages* at which specific situations have greater repercussion during the rest of the lifetime (Baum & Ruhm, 2007; Glymour et al., 2014). The specific case of adolescence is discussed in detail in section 9. 9.2. Adolescent's health, obesity, lifestyle, dietary habits.

8. Social Capital

8.1. The concept of social capital

The incorporation of social capital in the social determinants of health discourse has only increased, since it first appeared in the public health literature in 1996 cited in two relevant texts that introduced social capital as a potential explanatory factor to consider while studying SES

health inequalities (Kaplan, Pamuk, Lynch, Cohen, & Balfour, 1996; Wilkinson, 1996). Nevertheless, akin constructs to social capital such as social cohesion and social integration have been historically linked to health-related outcomes. Durkheim's seminal work on suicide is typically referred to as the best expression of the long-term use of these concepts in relation to health and wellness, although Woolcock (1998) mentions the work of David Hume and Edmund Burke as the philosophical origins of the notion.

A straight definition of social capital is not available to date. Instead, a myriad of approaches have been used by different authors, which have adopted the notion of social capital from many different social sciences' disciplines, such as sociology, political science, economics, education or anthropology, each of them introducing their own connotations. As a result, multiple definitions have been used to investigate and theorize about its relationship to health, creating a confusing and slippery landscape.

Sociologists Pierre Bourdieu and James Coleman, along with political scientist Robert Putnam have been referred to as the main parents of the concept, yet, significant differences stem from their approaches. Bourdieu explains social capital in terms of social networks and connections. In his model, individuals' network connections accrue shared norms and values, exchanges and obligations that can potentially provide access to different resources such as emotional, informational or instrumental support (Bourdieu, 1986).

Coleman defines social capital as a set of socio-structural resources "that have two characteristics in common: they all consist of some aspect of the social structure. And they facilitate actions of individuals who are within the structure", and he continues "Unlike other forms of capital, social capital inheres in the structure of relations between persons and among persons. It is lodged neither in individuals nor in physical implements of production" (Coleman, 1990, p. 302). Unlike Bourdieu, Coleman highlights the fact that social capital is a resource between families and communities, introducing a socio-structural approach.

Putnam (1993) extends the scope of the collectivistic approach by including in the definition elements such as sense of belonging, community cooperation, civic engagement and norms of trust and reciprocity. The focus here is not in the individual, but in the community in which it is embedded.

Despite the differences, what all of them have in common, and can be understood as the core of all social capital interpretations is, quoting Ottejber (2005) (in Morgan, 2011) , "*the presence of more or less structuralized networks between people or groups of people […] that facilitate certain actions for different actors within the structures*". This is to say, social capital can be understood as the resources that individuals can access thanks to their membership in a network, which bring benefits (and downsides) to both, the individual and the whole group/network/community. This distinction allows us to refer to ego-centered versus community-centered perspectives. On the one hand, individualistic approaches conceptualize social capital as the resources that individuals can access through their direct network connections; on the other, collective visions assume that these resources are not the result of individual connections *per se,* but rather they are the consequence of tightly-knit communities with cohesive relationships.

Concurrently, two approaches have been used to measure social capital: the social cohesion-based and the network-based perspective. Social cohesion refers to the extent of closeness and solidarity within groups, and as such, the most used measures tap into indicators such as sense of belonging, trust and norms of reciprocity. By contrast, network-based approaches to social capital attempt to map individual relationships and the resources embedded in those network ties. These resources are typically referred to as social support and are classified according to different subtypes, including emotional, instrumental, appraisal and informational support (House, 1981). Although an ongoing debate exists between these two schools and whether both can be under the social capital umbrella, the prevalent tendency is to consider the two of them as complementary streams of social capital theory (Kawachi & Berkman, 2014).

Although research normally restricts itself to one of these focuses, both dimensions are complementary and have been recognized and demonstrated to offer both benefits and downsides, although they unequivocally entail differences (Kawachi, Subramanian, & Kim, 2010; Moore et al., 2006; Villalonga-Olives & Kawachi, 2015). While some see these divergences as a weakness of the concept and a limitation of its validity, others argue that they reflect the rich array of hypotheses that have been made with regard to social capital relationships to health and that, when empirically tested, they allow us to understand a greater diversity of pathways through which this association may happen and, thus, to explore the usefulness of the different approaches to explain health (Morgan & Swann, 2004). In this direction, a genealogy of the concept in public health, such as the one provided by Moore and colleagues (2006), permits a

greater understanding of how social capital conceptualization has been forged in public health, influenced by the epistemological and social epidemiology context of the time. According to the results of their "citation-network path analysis", three factors underlie the emergence of social capital in public health "… (1) the search for an association of income distribution with mortality; (2) the mechanism had to be psychosocial in character; and (3) the psychosocial mechanism had to operate at the ecological level, a level that is conveniently seen in public health in geographical or special terms" (Moore et al., 2006, p. 732). Accordingly, a communitarian (also called social cohesion) approach, best represented by the work of Robert Putnam was appropriated by social epidemiologists to study social capital, which entailed a neglect of the measurement of social networks, since Putnam had based social capital measures in indicators such as trust, reciprocity and shared norms.

Since then, authors like Carpiano (2006), Lin (1999), Borgatti, Jones, & Everett (1998), Spencer Moore, Shiell, Hawe, & Haines (2005) among many others have claimed for a networked approach of social capital in public health, which now is being identified as a need for the advancement of this field of study even by the very same authors that adopted Putnam's approach in the first place, such as the epidemiologist Ichiro Kawachi himself (Kawachi & Berkman, 2014). Nevertheless, it does not mean that the social cohesion approach should be dismissed. On the contrary, consideration of both approaches should be taken into account.

Hence, in agreement to the explanation above, and the definition proposed in the Dictionary of Epidemiology (Porta, 2014), we refer here to social capital as the resources that are accessed by individuals as a result of their membership in a network or group, which includes both, the resources accessible through direct, individual connections - more related to social support, information channels and social credentials; as well as the ones that are available to all the members of a given network thanks to the relationships within the network itself –such as norms, trust and reciprocity. In both cases, social capital represents a feature of the social structure, an ecologic characteristic whether we look at it from the individual or collective point of view.

Different attempts to organize the complexity of social capital and to *reconcile* the different approaches have been made. Szreter & Woolcock (2004) supported the idea that differentiating between *bonding, bridging* and *linking* social capital could bring some light to this intricacy. This distinction is made in terms of homogeneity between the members of the group:

> "*Bonding social capital refers to relations between members of a network that perceive themselves as being similar in terms of their shared social identity. Bridging social capital, by contrast, comprise relations of respect and mutuality between people who know that they are not alike in some socio-demographic (or social identity) sense (differing by age, ethnic group, class, etc.)"* (p.6).

These two kinds are typically referred to as *horizontal* social capital, to the extent that they encompass relationships between equals or near equals; while *vertical* or *linking* social capital introduces hierarchical or unequal relations, steaming from differences in power, resources or status (Grootaert, Narayan, Jones, & Woolcock, 2004; Szreter & Woolcock, 2004).

A further distinction is that of *structural* versus *cognitive-attitudinal* (mostly referred to as *cognitive)* social capital. The structural component describes properties of the networks, relationships and institutions that bring people and groups together. On the other hand, the cognitive dimension is derived from mental processes and reflects people's perceptions of the level of trust, confidence, and shared values, norms and reciprocity (Lochner, Kawachi, & Kennedy, 1999).

Last, the scale which social capital is measured at constitutes an additional point that needs to be addressed. Public health research has investigated the effect of social capital embedded in very diverse contexts, such as state or country level, neighborhood, workplace, and to a lesser extent, family. The mechanisms through which social capital may influence health at these different levels are not the same, and, in agreement, the measures used to capture social capital in each of the cases should not be the same either. Although the question of the variety of mechanisms underlying the relationship between social capital and health is beginning to be understood, more solid research is needed, as well as an extended debate and consensus about how we measure social capital at each scale (Nyqvist, Pape, Pellfolk, Forsman, & Wahlbeck, 2013; Villalonga-Olives & Kawachi, 2015). Since thorough discussion texts and systematic reviews have already been published dealing with the effects on health of social capital measured at the neighborhood, community, region/state and country level –along or without individual measures (Almedon & Glandon, 2010; De Silva, McKenzie, Harpham, & Huttly, 2005; Kim, Subramanian, & Kawachi, 2010; Nyqvist, Forsman, Giuntoli, & Cattan, 2013; Nyqvist, Pape, et al., 2013), in the next section, we summarize the evidence on the association between social capital at these scales and specific health outcomes, the measures used to assess it, and the

mechanisms through which these associations are hypothesized to happen according to the different dimensions. The family context has been identified as a glaring gap in the health-related social capital research. Thus, because of its acknowledged relevance for health, especially among youth, a specific section is dedicated to this topic.

8.2. Social capital and health: issues of scale, dimensions and measurement

8.2.1. Social capital at the macro level: country and state measures

Most of the very first studies investigating the potential effect of social capital on health were conducted at a state/country level. For example, Kawachi and colleagues found in a cross-sectional study based on data from 39 US states that the increased mortality seen as a result of income inequality (measured through the Robin Hood Index), was mediated by a disinvestment in social capital (Kawachi et al., 1997). States with a lesser egalitarian distribution of income showed higher level of social mistrust which, in turn, was associated with higher mortality rates. In this study, social capital was measured by two items from the General Social Survey, namely, per capita density of membership in voluntary groups in each state, and the level of social trust, estimated through the share of residents in each stated that agreed that people could be trusted. For both indicators, there was a correlation between social capital and age-standardized total and cause-specific mortality rates. The authors discuss whether poverty might be a potential confounder, and while they dismiss this hypothesis after adjusting for state poverty rates, educational attainment, age, race, urban/rural mixes are mentioned as further elements to take into account. As a matter of fact, the interaction between different social determinants of health and social capital is still under study as important covariance can happen (Mohan, Twigg, Barnard, & Jones, 2005). For instance, social capital appeared to be associated in less-egalitarian societies, while it showed no association with health where resources were more equitably distributed (Islam, Merlo, Kawachi, Lindström, & Gerdtham, 2006)

Measures of social capital at a *macro level* encompass measures of trust, civic engagement, reciprocity, informal control and perceived social support, although they vary greatly depending on whether such measures have been designed for the specific purpose of gathering information about social capital or have been adapted from already existent questions within health surveys.

Generally, the first studies on social capital used *proxy* measures adapted from existing surveys; while, with the advancement of the field, studies have been more and more explicitly designed to assess social capital's relationship to health, and tend to be based on a stronger foundation about how these associations with each specific health outcome are thought to occur (Kawachi & Berkman, 2014).

The use of *trust* as an indicator of social capital has been questioned (Harpham, 2008). Lin (1999) posited that, as an individual trait it can be either a precursor or a consequence of social capital, but not actually social capital itself. Kawachi et al, also showed their disconformity with regard to the use of this indicator because of its possible confusion with hostile personality traits (Kawachi et al., 2010). However, they defend that perceptions of trust, when measured at an aggregated group level, represent the collective level of trustworthiness, so it is less likely to be confounded by personality traits and, thus, a valid measure of social cohesion.

In a review of studies linking social capital and different physical health outcomes, including mortality, self-rated health, and communicable (acute infectious diseases) and non-communicable diseases (obesity, CVD, cancer and diabetes), Kim et al (2010) found that, out of the 65 papers identified, most studies were conducted at an ecological level and focused on a single indicator of social capital such as social trust, group membership or reciprocity, that had been derived from aggregating individual survey at the area level (conceptualized as country or state/region level in more than half of the cases). Overall, trust, as an indicator of social cohesion was correlated with better physical health, with a stronger effect in the case of self-rated health and for individual level perceptions; while group membership showed the weakest relationship. Importantly, the fact that both, trust and self-rated health are based on individuals' perceptions, makes it necessary to consider the likelihood of reverse causation occurring. On the other hand, the authors also celebrate the fact that multilevel analysis, which allow us to differentiate between compositional and contextual effects, are more and more frequent.

Cultural and social contexts are likely to influence the effect of social capital on health related outcomes, given the fact that relationships are embedded in cultural norms. So, caution must be taken when importing social capital studies' conclusions from around the globe. In a European context, the WHO Regional Office for Europe has made an effort to acquire *local* evidence, before the overwhelming research conducted in the US. Using data from the European Social Survey from 14 European countries, Rocco and Suhrcke examined the association

between individual and community social capital (aggregated at a country level) on health adjusting for a number of sociodemographic variables, and the findings were that while social capital exerts a positive influence on self-rated health, community-level social capital has no independent effect once controlled for individual social capital (Rocco & Suhrcke, 2012). Nevertheless, they warn the reader that community-level social capital may indeed have a positive effect on health, when measured at a smaller level. This is, *communities* would be relevant to health when conceptualized at a closer level to the individual, such as neighborhoods or other local areas.

Two main pathways through which country/state level social capital is likely to influence health have been proposed (Kawachi et al., 2010; Morgan & Swann, 2004; Rocco & Suhrcke, 2012):

(1) Informal control and normalization of health-related behaviors, according to *shared* values of what is acceptable and desirable, thanks to which community members are able to maintain or achieve the desired goals.
(2) Enhanced collective efficacy in front of significant health-related issues, fruit of a cohesive community that is willing to intervene for common goods because of the mutual trust and solidarity among neighbors. *Collective efficacy* has been defined by Zaccaro, Blair, Peterson and Zazanis (1995) as "a sense of collective competence shared among individuals when allocating, coordinating and integrating their resources in a successful concerted response to specific situational demands". For example, a community with higher levels of social capital may be more effective in lobbying against cuts in public services or engaging collective action to obtain health-promoting goods such as public green areas or sport facilities, as well as to deal with collective hazards.

While a greater access to health relevant information as a result of an increased social interaction with other individuals or groups has also been mentioned as a potential mechanism underlying the links between social capital and health at a state or country-level, evidence shows a great deal of variation across geographical regions. This is due, on the one hand, to the above mentioned strong correlation with income inequalities.

On the other, this is due to the different interactions that the components of social capital and the particular institutional and political characteristics of different types of welfare states are thought to generate in relation to health outcomes. According to Rostila, following the classification of Esping-Andersen (1990), social-democratic regimes such as those in the Nordic

Countries have implicit higher levels of universalism and solidarity, when compared to the other two regime types, namely the market-dominated *liberal* regime (in which state-protection is scarce and citizens are obligated to rely on personal connections to access more resources – as is the case of the US, UK or Ireland), and the *conservative/corporativist* type (where rights and benefits are strongly attached to class and status – as what happens in France, Germany or the Netherlands, among others). *Mediterranean* and *post-socialist* regimes are also analyzed by Rostila. The *Mediterranean* regime (as represented in Spain, Italy, Greece and Portugal), is characterized by an even higher degree of familialism and a less developed social security system. Last, *post-socialist* regimes, such as those found in the postcommunist Eastern Europe show the lowest levels of social benefits, along with the highest levels of social inequalites and poverty. These differences in the sociopolitical landscape constitute strong structural forces that shape the effect that social capital at this level can have on health outcomes.

Of course, all these mechanisms can work towards both positive and negative outcomes. Alejandro Portes is typically cited when referring to the *dark sides* of social capital (Portes & Landolt, 2002; Portes, 1998). According to him, social capital effects are not always positive, since higher social capital can entail excessive demands among members to provide support to others, a restriction of freedom as a result of an excessive informal control and/or the exclusion of out of the network members, especially when bridging social capital within the group is low.

As a synthesis, studies measuring social capital at a macro level have relied on aggregated measures of trust, reciprocity, social support and civic engagement. Great advancement has been made in the field with regard to two questions: first, the fact that since the first research on social capital and health conducted in the late 1990s, studies have been increasingly been specifically designed for social capital-related research purposes, which provides a more solid foundation of the mechanisms and pathways through which social capital is hypothesized to influence different health outcomes. Second, the incorporation of multilevel statistical models that permit the independent influence of community and individual characteristics (including social capital indicators at both levels) on individual health outcomes. Overall, the effect of social capital at these levels seem to be interrelated with other social determinants of health and the state model, as well as with individual characteristics.

8.2.2. Social capital at the meso level: neighborhood and community measures

In this dissertation, we include under the heading of *meso* level, neighborhoods and other community groups such as workplaces, civic associations, schools, churches or other types of institutions.

Neighborhood level has been, by far, the scale at which social capital has been conceptualized the most, especially through a social cohesion approach. Normally, neighborhoods have been demarcated through postal or area codes, although this delimitation is being questioned because, in the end, does neighborhood or community mean the same for everyone? The failure to identify the spatial area with relevant meaning for the participants in the study can result in inconsistencies when associating contextual exposures to individual effects.

Whole network analysis overcome this difficulty by identifying all the individuals within the network, however these are costly and time-consuming, so they tend to be scarcer. The network analysis conducted within the Framingham study is an example of such work. Here, network influence on smoking, alcohol consumption, obesity and other health risks are examined in a longitudinal study from 1971 to 2003. Their results indicated that the risk of smoking was greater, the closest an individual was to someone that smoked. The average risk of smoking if one is closely tied by one degree of separation to a smoker is of 61%, versus 11% when the contact is three degrees of separation away. In the same way, smoking cessation was also *contagious* through social networks, with a higher percentage of quitters when they were closely tied to someone that stopped smoking (Christakis & Fowler, 2008).

As for the case of obesity, different risks were also seen depending on the ties. In fact, clusters of obese persons were discernible through tie connections, while these were not seen among people in the same geographical area. Specifically, an individual's likelihood to become obese, increased by 57% if a friend became obese, by 40% if it was a sibling who had become obese and by 37% when it was a spouse (Christakis & Fowler, 2007). These findings support the notion that social relationships exert a great influence on health outcomes and behaviors, yet they have to be interpreted within the broader context in which they occur (Berkman & Krishna, 2014). Smoking cessation is very likely to be also influenced by the effect of preventive regulations and programs occurring in society. Notwithstanding, smoking prevalence in the US has been reduced by half in the last four decades, while it has increased more than two-fold in the case of obesity.

In any case, despite the detailed analysis that they allow, socio-centered network studies are not very common because of the elevated time and expenses involved in network analysis, which along with the traditional predominance of Putnam's approach in the study of social capital in Public Health, explain the much larger number of studies developed following a social cohesion-based perspective. In this context, and to address the challenge of spatial delimitation, prospective studies provide a method to improve causal inference, along with the addressment of other obstacles such as confounding by omitted variables. Unfortunately, most of the studies conducted up to date are cross-sectional.

Two reference-instruments to measure community social capital through health surveys are the World Bank's Social Capital Assessment Tool, SOCAT (Grootaert & Van Bastelaer, 2002), and the Adapted Social Capital Assessment Tool, ASCAT (Harpham, Grant, & Thomas, 2002) along with its short version. Besides the robustness of such questionnaires, an additional strength of these tools is the fact that it allows comparisons between studies, even when cultural adaptations have been made, as is the case of the work done within the Young Lives study (De Silva, Huttly, Harpham, & Kenward, 2007; De Silva et al., 2006; Harpham, De Silva, & Tuan, 2006). Using data from this study, De Silva and colleagues published in 2007 a comparative study on the association between mental health and social capital in mothers of 234 communities in Peru, Ethiopia, Vietnam and India. Here, individual and community level were assessed using multi-level modelling. Social capital data was collected using the SASCAT. While it does not measure bonding, bridging and linking social capital, it is specifically designed to assess cognitive and structural social capital in low income countries. And, in fact, their results showed interesting differences between these two components, and other subdimensions such as group membership, social support and civic engagement at both, the individual and ecological levels. Broadly, cognitive social capital was associated with reduced odds of depression and anxiety in all four countries, while structural social capital effects varied across countries. The mechanisms that were proposed to mediate these associations were, at the individual level, reduced support through social networks and feelings of insecurity, which might cause a reduced coping capacity along with chronic stress, resulting in altered neuroendocrine states. As for the community pathways, the effects were related to a low community efficacy with regard to informal control over deviant behaviors, poor health related behaviors, reduced access to health services and less economic development which, in turn, increased the likelihood of engaging in substance abuse and other harmful behaviors, poverty and low access to preventive and therapeutic treatments. In relation to the contextual versus compositional debate, their findings support,

again, the notion that while context is an important predisposing factor, individual characteristics hold the highest importance.

Most studies however, develop their own measures of social capital, often without being properly validated (Harpham, 2010). Murayama, Fujiwara, & Kawachi (2012) took the endeavor of reviewing the available multilevel studies of the association between social capital and health. They found 13 multilevel prospective studies, 9 of which measured contextual social capital at a community level and 4 at workplace level. Their results showed that, globally, both individual and contextual social capital were associated with positive health outcomes, such as a reduction in mortality, lower rates of depression, smoking cessation and self-rated health. Most studies differentiated between structural and cognitive components of social capital, but their results were not reported in these terms. Half of the studies measured social capital by aggregating survey responses to the contextual levels, while the others used proxy variables from administrative databases to measure social capital. As in the studies at a macro level, individual perceptions of social capital were more consistently related to health outcomes than contextual measures. However, the authors highlight the need for more prospective studies to gain enough understanding of the phenomenon to use social capital theory for health promotion.

In contrast to the review of Kim et al. (2010) in which trust measures were the most strongly associated with physical health outcomes, a meta-analysis of cohort studies was conducted on the specific case of all-cause mortality. It was found that social participation and informal social networks (both as measures of structural social capital) were negatively associated with mortality, with weaker influence for social network after adjusting for age and gender. Cognitive social capital measures were also considered in the analysis. While trust also appeared to show a negative relationship with mortality, perceived social support did not show such association (Nyqvist, Pape, et al., 2013). A relevant difference with regard to Kim's review is that most of the studies included in this meta-analysis measured community social capital at a neighborhood level. A big strength of this review is the use of prospective cohort studies with a follow-up longer than 5 years, which reinforces causal interpretation.

The pathways by which social capital at the meso level is presumed to exert a contextual effect on individual health are consistent with the ones described in the previous section, while they include some local specifics. These are: the diffusion of information on health-related questions, the maintenance of health-related norms through informal control, the promotion of access to

local services and amenities and the psychosocial processes that provide mutual support (Kawachi & Berkman, 2014).

8.2.3. Social capital at the individual level: Ego-centered measures

When looking at social capital as an individual asset, two approaches can be used, according to whether social capital has been defined complying with the network or the social cohesion perspective. On the side of network analysis, research is orientated towards the resources or influence that a particular tie provides, based on a theoretical foundation of what resources may be important in relation to the outcome being studied (Lakon, Godette, & Hipp, 2010). Network analysis focuses on the characteristic patterns of ties between actors in a social system, rather than on characteristics of the individual actors themselves (Fisher, 1992; cited in Berkman and Krishna, 2014). Tools like Name Generators, the Position Generator (Lin, 2001) or the Resource Generator (Van Der Gaag & Snijders, 2005) are examples of instruments used within this context.

The Position Generator assesses the social resources to which an individual can gain access through its connection to somebody that, because of his or her occupation, is expected to embody valued resources represented by wealth, power and prestige. The respondent is, thus, handed a list of positions and asked whether he or she is acquainted with someone with specific occupations and the questionnaire yields a result in the form of "upper reachability", which indicates the highest level of occupational prestige among his or her ties, based on the notion that occupational prestige is a good indicator of social resources.

The Resource Generator is more complex in its use, because it requires that the researcher defines the list of relevant resources beforehand. However, it can be more precise than Position Generators with regard to health outcomes, since it measures access to specific resources that are relevant to the outcome. Besides, it gives information that can remain silent with the position generator, such as the resources provided through home-based economies.

Name generators are sociometric measures that include a whole mapping of an ego-centered network and are considerably more time-consuming than the other two instruments. On the other hand, they are –obviously- more thorough, and unlike resource generators which typically

focus on instrumental resources, a greater emphasis is put on emotional support (Kawachi & Berkman, 2014; Lakon et al., 2010).

Beyond these, many other approaches have been used to assess networks and social relationships. Berkman and Krishna (2014) argue that the isolated use of these tools may omit upstream forces such the influence of society norms and values, the sociopolitical context or other socioeconomic factors such as poverty or inequality rates. These two authors also gather extensive evidence of studies examining the association between social networks and social relationships on health. Readers are referred to their text for an exhaustive review on the topic, since this is not the goal of this dissertation. Only with regard to all-cause mortality, more than 140 prospective cohort studies have been included in a meta-analysis, generally agreeing on the protective effect of social relationships at all life-stages. Results are conflicted (and more limited) with regard to cardiovascular diseases, although evidence on the importance of social support to prevent death from cardiovascular diseases and to enhance recovery from stroke is increasing, especially when combined with measures of stress exposure. Other health outcomes studied with regard to social networks include cognitive function, resilience, infectious diseases, depression, smoking and obesity.

On the other extreme, social cohesion-based measures do not try to capture information about the respondent's social network. Rather, survey items inquire about the resources that individuals can gather thanks to their belonging to a group, through the assessment of their attitudes, cognitions and perception about the group (that is, cognitive social capital) on one hand, and of their actual behaviors of interaction and participation (structural social capital) on the other. In this way, questions about social capital at the individual level from a social-cohesion perspective, equate the type of inquiries made through the same approach but at an ecological level (whatever the spatial area is defined as), and tap into questions such as trust, shared values and norms, perceptions of collective efficacy and informal control as part of cognitive social capital, and social interaction, civic engagement and social support concerning the structural dimension. Network approaches, when operationalized through surveys do not differ much from this approach (Carpiano, 2006; Kawachi & Berkman, 2014)

Mechanisms through which ego-centered social capital may influence health include the following (Berkman & Glass, 2000; Smith & Christakis, 2008):

(1) The provision of social support (both perceived and actual), which according to Lindgren (1990) "allows one to believe that he or she is cared for and loved, esteemed and valued, and belongs to a network of mutual obligation' (p. 469). Here, she is referring to emotional social support, but other subtypes of social support are normally identified, including emotional but also instrumental, appraisal and informational support (House, 1981).
(2) Social influence through shared norms or social control. Here face-to-face contact is not a requirement for social influence to occur. Nor is it a deliberate intention to modify other's attitudes or behaviors. On the contrary, people obtain normative guidance by comparing themselves' to others within the same group (Marsden & Friedkin, 1993; Turner, 1991).
(3) Social engagement and social participation, which result from the representation of the potential roles in real life. Being a parent, a friend, a worker, a sports fan… provides the individual with different resources and opportunities (Berkman & Krishna, 2014).
(4) Person-to-person contacts, which are especially relevant in infectious diseases through pathogen exposure, or certain behaviors such as secondhand cigarette smoke or shared food or drinks.

At this level, the influence of social networks on health behaviors (as discussed above), psychological (such as the effect of gratitude, loneliness or security on self-efficacy, self-esteem or depression) and physiological (like an increase of inflammatory markers of cortisol levels) mechanisms are ultimately responsible for their influence on health outcomes. As with other scales, outcomes here can be both positive and negative.

Table 1 provides a synthesis of this section, with the aim to clarify the different measures used to assess social capital according to the different approaches and scales of measurement, as well as the pathways through which it influences health in every case.

Table 1

Measurement approaches and mechanisms through which social capital at the different scales is thought to influence health.

	Measurement approaches		**Mechanisms**
	Social cohesion approach	**Network-based approach**	
Macro-scale Country and state	Aggregated survey-based responses on trust, civic participation or engagement, reciprocity, informal control, perceived social support.	-	- Informal control and normalization of health-related behaviors - Collective efficacy
Meso-scale Neighborhood, workplaces, schools, churches, other institutions, etc.	- Aggregated survey-based responses on trust, civic participation or engagement, reciprocity, informal control, perceived social support. - Specific instruments such as ASCAT and SOCAT.	Socio-metric network analysis	- Informal control and normalization of health-related behaviors - Collective efficacy - Social support (in all its forms)
Micro-scale Individual level	Survey-based assessment of individual perceptions (e.g., trustworthiness, reciprocity, shared norms) and behaviors (e.g., civic participation, social interaction)	- Ego-centric network analysis. - Instruments such as the Position and Resource Generators	- Social support (in all its forms) - Social influence - Social engagement and social participation - Person-to-person contacts

8.3. Social capital, obesity and obesity related-behaviors.

In contrast to the overwhelming number of studies on social capital and health outcomes such as all-cause mortality or self-rated health, research on obesity is much more recent and limited. Nevertheless, it has notably increased during the last years. In 2010, Kim et al. identified only four studies that examined the potential effect of social capital (at different scales) on obesity. In 2014, after a search in PubMed, the Cochrane Library, the ISI Web of Science and PsycInfo databases, using the terms “social capital”, “obesity” and “overweight”, we came up with 16 observational studies that reported a statistical test of the relationship between constructs of social capital conceptualized according to the *social cohesion* approach, which was measured at a neighborhood/community level and obesity, defined in terms of BMI. Of these, only 6 were conducted with adult population. The other 10 papers refer to adolescent population, and will be discussed in section 9.3.

At a macro scale (state or county), two commonly cited studies with regard to social capital and obesity at macro level are those of Kim and colleagues (Kim, Subramanian, Gortmaker, & Kawachi, 2006) and of Holtgrave and Crosby (2006). Kim et al, in a prospective multilevel study in which social capital influence on individual obesity and leisure-time physical activity was studied, found that living in states with higher social capital was associated with a lower likelihood of both physical inactivity and obesity, controlling for individual sociodemographics, urban sprawl, state-level estimates of mean household income, the Gini coefficient, and the percentage of Black residents. When social capital was measured at the county level, odds of being physically inactive -but not of being obese- were also reduced for higher social capital levels. However, the fact that the associations between state-level measures of formal civic and political participation with both outcomes were weaker than the measure tapping into attitudinal and informal socializing, suggests that social capital might have a more predominant effect at the local level when compared to statewide influences. Measures of social capital included two state-level and two county-level scales. Interestingly, they reported differences among ethnic groups, according to which American Indians and Hispanics were *less protected* by social capital. A possible explanation is the increased likelihood of individuals in these groups to be obese or physically inactive, respectively. Last, little support was found for mediation by social capital of the associations of urban sprawl and income inequality with obesity or physical inactivity.

Holtgrave and Crosby, in turn, investigated the potential beneficial factor of social capital against obesity and diabetes at the US state-level. They obtained social capital measures from Putnam's public use data set, which portrayed social capital states levels in the 1990s as a combination of 14 variables of community life, civic engagement, volunteerism, informal sociability and social trust, specially elaborated to measure collective social capital. Their findings indicated a protective effect of social capital on both obesity and diabetes, even after taking into account poverty rates in multivariate linear regressions, with social capital explaining 10% and 44% of the variance in obesity and diabetes, respectively. Unfortunately, a separate analysis for the different dimensions of social capital is not available in this study.

Down to the neighborhood level, evidence on the relationship between social capital and obesity in adults is scarce and disperse. To begin with, Greiner, Li, Kawachi, Hunt, & Ahluwalia (2004) found no evidence of obesity being associated with trust or social participation. Results from the RESIDE study, an Australian study in which the influence of both the built and social

environment on BMI was assessed, showed no association between any of the measures of either of these two contexts, with the exception of perceived safety from crime (Christian, Giles-Corti, Knuiman, Timperio, & Foster, 2011). The authors suggest that physical activity could mediate this relationship, because there could be a reduction in physical activity due to perceived insecurity, which is consistent with the findings of Mohan, Twigg, Barnard and Jones (2005), Doyle et al (2006), Burdette and Hill (2008), Foster and Files-Corti (2008) and Cohen (2008). In the UK, in contrast, Poortinga found that although social nuisances were related to higher obesity, this relationship was not mediated by physical activity practices (Poortinga, 2006).

Notably, although some studies have considered perceived safety as an indicator of social capital, we agree with Harpham (2004) and Kawachi et al. (2010) that such indicators as well as social nuisances, friendliness or access to amenities, should not be read as a dimension of social capital itself, but as an intermediate variable that is likely to influence the effect of social capital on health.

One interesting feature of Poortinga's study is the fact that the different dimensions of social capital assessed were independently associated with different health outcomes. Social capital measures included a 7-item scale on social support, one item on trust and 1 item on social participation. It was found that only trust was protective against obesity, and specific measures of social trust, and civic participation with obesity-related behaviors such as walking, sports and overall physical activity. Their models also showed a considerable age and SES gradient, according to which older and low SES groups were more likely to suffer obesity. Veenstra et al (Veenstra et al., 2005) obtained similar results in Hamilton (Canada), where associational involvement and neighborhood relationships were correlated with obesity after adjusting for other variables.

Due to the cross-sectional nature of the studies above, results must be interpreted prudently with regard to causality. For example, one could think that the association between social capital and obesity could be the other way around, indicating that obese individuals are less prone to participate in social groups or interact with neighbors. Borgonovi (2010) shed some light in this direction, thanks to the results of a British longitudinal study using data from about 17,500 individuals in the National Child Development Survey (NCDS) and the 1970 British Cohort Study (BCS). Social capital measures included membership in social groups, trust, and shared norms.

Again, different forms of social capital were associated with different health benefits: while interpersonal trust was particularly correlated with self-assessed health and mental well-being, membership in groups and associations was strongly associated with low levels of obesity, alcohol abuse and dissatisfaction with life.

Applying a network approach, sociometric studies such as the one by Christakis and Fowler (2007), showed how being connected to someone that became obese increased the risk of gaining weight up to four degrees of separation. Although the longitudinal design of this study certainly strengthens these results, as discussed above, the global increase in obesity prevalence can hijack the interpretation of these findings. On the other hand, Moore and colleagues findings revealed that unlike other studies, indicators of trust were not associated with a decrease in obesity, while social capital measured through the position generator was.

In 2010, Ross Hammond published a paper entitled "Social influence and obesity" in which he reviewed the papers published in the previous year. His conceptualization of social factors is slightly different from what we have presented, as he seems to refer to social influence as the effect of social networks on behavioral and health outcomes. He identifies several mechanisms through which social influence can be related to obesity: social norms on food, social norms on body image, social capital and social stress. The definition of social capital that he proposes: "the resources, information, and people accessible through a social network" (Hammond, 2010, p. 369), would be, in our view, more alike to the previously defined concept of social support. In any case, however, he provides evidence that all the dimensions he explores have an effect on obesity. For example, he reports that adolescent girls odds of be on a diet to lose weight increase substantially when many overweight peers are also trying to lose weight (as effect of the norms of body figure) or that an individual is more likely to eat bigger amounts when he or she is eating with a non-familiar peer. In this paper, data on the effect of social stress on eating behavior is drawn from animal models, but other studies suggest that under stress conditions, humans tend to modify their food intake, especially towards sweet foods (Oliver & Wardle, 1999; Wardle, Steptoe, Oliver, & Lipsey, 2000). Alterations in the physiological functioning of the hypothalamic-pituitary-adrenal axis is one of the explanations behind this phenomena (Kubzansky et al., 2014; Sominsky & Spencer, 2014).

Hence, what we observe is that research on the association of social capital with adult obesity is quite incipient, and that evidence of its causality and even direction is not clear yet. It is our

position that exploring the relationship between social capital and obesity-related behaviors such as physical activity practice, diet (and stress, sleep, etc.), as well as understanding the pathways through which it happens (or not) could shed some light on this point.

We have seen in the examples cited above that some of the studies did take behavioral intermediates into account, but as far as obesity is concerned, they always referred to physical activity. The link between social capital and dietary habits is a much less explored area. In 2010, Martin Lindström wrote, in a chapter on social capital and health-related behaviors (Lindström, 2010):

> *"We have already noted that more research is needed on the relationship between social capital and health behaviors such as tobacco smoking, alcohol consumption, drug abuse, and physical activity. The need for studies on the association between social capital and nutrition seems to be even more urgent".*

And the fact is that studies on social capital and nutrition have been more focused on exploring how social capital can leverage people confronting food insecurity situations than on obesity-related behaviors. It means that the little research conducted in this area has mainly being set out to know to which extent can social capital mediate the relationship between low SES and diet. In the US a moderate protective effect of social capital towards a healthy diet was shown (Dean, Sharkey, & Johnson, 2011; Johnson, Sharkey, & Dean, 2010; Locher et al., 2005; Martin, Rogers, Cook, & Joseph, 2004; Walker, Holben, Kropf, Holcomb, & Anderson, 2007). In a European context, social participation reduced socioeconomic disparities in vegetables intake in both genders and fruit intake in women, although this effect was not seen with regard to fruit juices (Lindström, Hanson, Wirfält, & Ostergren, 2001).

A taxonomy of the social environment dimensions that influence health behaviors and the pathways through which they operate has been established by McNeill, Kreuter, & Subramanian (2006). Using physical activity as an example, they describe how social support and networks; socioeconomic position and income inequality; racial discrimination; social cohesion and social capital; and other neighborhood factors such as exposure to harmful elements can influence behaviors. The mechanisms that they describe with regard to social capital are consistent with what was defined by Locher et al (2005) in relation to dietary habits. Specifically, they suggest three main mechanisms: (1) cohesive communities may provide more resources and support than non-cohesive neighborhoods, (2) norms and values of sharing meals and foods, and a

better commitment with healthy behaviors that are mainly encouraged from religious institutions, (3) perceptions of a safe environment which promote a more frequent practice of outdoors physical activity. In the case of elderly, too, unsafe neighborhoods can even be associated with a reluctance to go out to buy the groceries. Civic engagement may be an additional pathway through which social capital encourages healthy eating. This can be explained by a higher sense of obligation toward oneself and to others, that would eventually lead to proactive nutrition-related activities, as seen with regard to adherence to Mediterranean diet among pregnant women (Kritsotakis et al., 2015), or better nutritional habits at home when moms had higher levels of social capital (Moxley, Jicha, & Thompson, 2011).

8.4. Family social capital, the missing level in studies of social capital and health

As evident in the sections above, most of the empirical research on social capital and health has focused on the neighborhood as the unit of interest, i.e. the potential health benefits (as well as downsides) accruing to the residents of communities as a result of their being connected to their neighbors. However, one glaring gap in the empirical literature on social capital and health has been the level of the family, which is remarkable since individuals are primarily nested in families, and family social capital has been posited by many authors as a cornerstone of social capital (Bourdieu, 1986; Coleman, 1988; Fukuyama, 1999; Newton, 2001; Putnam, 1995). It does not mean that the family context has not been investigated in the health field: the relevance of family has been widely acknowledged and there are notorious contributions on the effect of family functioning and family cohesion on health, especially from behavioral and developmental sciences (see Collins and Laursen 2004; Grzywacz and Marks 1999; Hansen 2005; Lareau 2003; Levin and Currie 2010; Luecken, Roubinov, and Tanaka 2013; Roustit et al. 2011; Schor and Menaghan 1995; among many others), but these have not been explored much through the lenses of social capital.

Accordingly, in the following pages we examine the family as the “missing level” in studies on social capital and health, and aim to provide an overview of the use of the concept of “family social capital” in the health literature as well as the constructs used in its measurement. To do so, a systematic search in the PubMed, Web of Science and Sociological Abstracts databases was conducted using different search strategies built with the assistance of a medical librarian. The Boolean operators were built specifically for each of the databases and included different terms

for the concept of “family”, plus the term “social capital”. The decision of limiting the sample to studies mentioning explicitly “social capital” was made with the intention of specifically investigate the use of the social capital theory to study the influence of family dynamics on health.

The search provided 718 references and additional articles were identified from the bibliography of this first search, which resulted in 317 documents after removing duplicates Four inclusion criteria were used to distinguish the relevant literature: (1) papers based on quantitative empirical research (2) measuring social capital within the family (3) having a documented health outcome, (4) with full text accessible. A total of 29 papers conformed to these criteria and were tabulated to facilitate the analyses. Table 2 shows the full list of references together with their descriptive data.

8.4.1. Concept of family social capital

James Coleman is recognized as the first scholar to bring the social capital discourse to the family environment. To him, the main function of family social capital is to make parent’s human capital available to children, and it depends “both on the physical presence of adults in the family and on the attention given by the adults to the child” (Coleman 1988:S111). Family social capital is here seen as the *means* through which parental human capital can be accessed by the child, and two key dimensions are distinguished, one referring to the structure and another to the function. Hence, high family social capital entails not only the physical presence of adults in the household (e.g. two parent households), but also the presence of supportive interactions between parents and their children (which does not always exist even if the parents are physically present).

In his work “Social Capital in the Creation of Human Capital” (1988), Coleman explores how family social capital is relevant to the educational achievement of children. The ratio of parents to children, the frequency of talking to parents about personal experiences, the frequency of discussions with parents about personal matters and the mother’s expectations about the child’s education were adopted as indicators of family social capital. His results showed that the ratio of parents to children and the mother’s educational expectations were associated with a

decreased risk of dropping out of school, while the frequency of talking to parents about personal experiences was not related.

Several critiques have been made to Coleman's operationalization and measurement of family social capital. For example, the Australian Institute of Family Studies has made a considerable effort in the last fifteen years to provide further foundation to family and community social capital, resulting in two comprehensive publications in which Winter (2000) and Stone (2001) discuss, respectively, the concept and measurement of these two kinds of social capital. In both texts, a point is made that the Coleman measures are biased, since they only capture information related to the "network" component of social capital, failing to take into account the quality of those relationships, and consequently not capturing the elements of "trust" and "norms" within family relationships. In fact, Coleman did attempt to measure the quality of family relationships, but Winter's argument is that using "the frequency of talking with the parents about personal matters" as the only indicator to assess quality fails to reflect the true nature of such interactions. Another interesting critique refers to Coleman's emphasis on the negative effects of an increasing number of children in the family, which ignoring the potential benefits of an extended network.

In examining the existing accounts of the creation of family social capital, Morrow (1999) has argued that the concept is scarcely developed as it relates to the role of children and that a youth's perspective on family social capital is missing in the scientific literature; that is, they are most often viewed as mere receptors of social capital without contributing to its creation. Hence, she advocates for "a more 'active' conceptualization of children drawing on the sociology of childhood" (1999:751) that would allow an exploration of "how children themselves actively generate, draw on, or negotiate their own social capital or indeed make links for their parents or even provide active support for parents" (1999:751).

Along the same lines, White (2008) points out the need to consider the extent to which social capital accumulation is shaped by individual characteristics such as gender, age or ethnicity. Her research is innovative because it provides a new frame for social capital theory, based on a developmental theory approach. That is, she studies how parental beliefs and behaviors are associated with youth beliefs and functioning and also provides a possible pathway through which gender, age and family structure affect family social capital. By doing so, White attempts

to reconcile the sociologic and psychological perspectives on family dynamics and processes towards a better understanding of how they influence different outcomes.

Notwithstanding these debates and critiques, Coleman's original work has undeniable merit in drawing attention to the concept of social capital in the family context. Since then, a number of authors have studied family social capital in relation to different outcomes, such as academic achievement (Dufur, Parcel, and Troutman 2013; White and Kaufman 1997), children's cognitive and social development (Amato, 1998; Furstenberg & Hughes, 1995), occupational aspirations (Kilpatrick & Abbott-Chapman, 2002; Marjoribanks, 1991), civic engagement (Mahatmya & Lohman, 2012), delinquent involvement (Paul, Cullen, Miller, & Wright, 2001) and to a lesser degree, health-related outcomes.

8.4.2. Family social capital in the health literature

From the review of the papers in our sample, it can be learnt that family social capital in the health literature has been mostly operationalized by adapting the concept of social capital to the family context. This is, a definition of social capital is offered and then framed to fit the boundaries of family. The depth of the analyses varies, from some authors using simple indicators such as the frequency of parents playing games with their children (Berntsson, Köhler, Vuille, & Kholer, 2007), to others even attempting to differentiate between the structural and cognitive dimensions of social capital or bonding, bridging and linking relationships within the family (Gonsalves, 2007; Widmer, Kempf, Sapin, & Galli-Carminati, 2013). In short, we can say that the approach described begs two questions: (a) what is the definition of "social capital"?; and (b) what is the definition of "family"?

Reflecting the broader *state of the art* social capital research, a variety of definitions of social capital have been used, drawing on those elaborated by Bourdieu (1986), Coleman (1990), Putnam (1993) or Lin (2001), among others. What they all have in common is their attempt to capture the extent and nature of family-based network ties. Also in agreement with the research on social capital and health at other levels, two distinct streams have emerged, viz., the social cohesion and the network conceptions of social capital (Kawachi & Berkman, 2014; Kawachi et al., 2010).

Research on family social capital and health has relied on both the social cohesion and the network approaches. However, there are notable differences in the use of the two approaches in relation to the subjects' life stage and characteristics: for example, research on the elderly as well as people with disabilities have almost exclusively relied on the study of networks and social support, as opposed to investigations in children and youth, which have tended to adopt the social cohesion approach.

One reason why the network approach has not been developed as much as the social cohesion approach may be the way in which "family" has been defined in these studies. As previously discussed – taking off from Coleman's work - a good part of the research on family social capital has focused on how certain parent-child relations make resources available to children. Seen in this way, the network is something that does not need to be defined, since it is already implicit: the family network is constituted only by the children and their parents. However, the nuclear family is only one possible conceptualization of "family social capital". In many cultures – for example, in Asia as well as the Mediterranean - the definition of "family" extends out to a much broader set of connections. The extended network of relatives in these cultures can provide different kinds of social support that certainly ought to be construed as a part of family social capital. The study by Widmer and colleagues (2013) provides one of the few examples in which a thorough assessment of the family network was actually conducted. In their research, they applied the *Family Network Method,* a specific sort of *name generator.* As in other name generators, participants are asked to provide a list of persons -in this case, persons whom they consider significant "family members"- for whom they also answer some questions about emotional support, conflict and influence in their own relationships as well as between the other family members previously identified. The question about emotional support, for example, is introduced as follows: 'From time to time, most people discuss important personal matters with other people. During routine or minor troubles, who would give emotional support to X?'. A similar approach can also be found in Litwin and Stoeckel (2014).

The question of what constitutes a family is not a trivial one. Given the heterogeneity of family roles and structures even in western societies (European Communities, 2003; United States Census Bureau, 2011), a straightforward adoption of the household and/or conjugal family as a unique form of family is, to say the least, biased. With the increase of divorce and remarriage and the high predominance of single parent families it is increasingly difficult to set the boundaries of families (Buehler & Pasley, 2000). Following Riera (2011), the family is the primary

core of affection and protection, and as such the form that this institution takes is more and more a subjective experience. Furthermore, the problem about using the household as a proxy of the family is not only that it is likely to be incomplete (since many family members may be residing outside the household, e.g. working in a foreign country and sending remittances back home), but it may also not capture what the individual feels is his or her family. Last but not least, caution must be exercised in equating single parents with a lack of family social capital. Jennings and Sheldon (1985) argue that due to the high collinearity between family composition and other socioeconomic factors, it is not possible to attribute variations in health only to family structure, an observation that Lareau (2003) expands to the strong association between social class and parenting approaches. It has also been noted how informal networks of care outside the household can compensate and even provide greater care assets than the nuclear family itself (Hansen, 2005), which reinforce the need of considering the whole constellation of relationships if we are to elucidate the effect of and the pathways through which family social capital on health.

Actually, few studies discuss the mechanisms through which family social capital can affect health. Yet we can find interesting parallels with the broader discourse regarding social capital at the neighborhood level. According to Kawachi et al. (2010) three mechanisms seem to mediate the relationship between social capital and health at the individual level: social influence/social control, social engagement, and the exchange of social support. In our literature review, these also appear to be important with regard to the family context. In their study, Moxley and colleagues (2011) found that the main dietary decision maker within more cohesive families was more likely to make healthy choices, suggesting that strong family bonds can encourage their members to gain knowledge about health and learn how to take care of others. They also observed that families with strong ties are more prone to eat meals together where information and behaviors about healthy eating can be reinforced. Pettit, Erath, Lansforf, Dodge and Bates (2011), in turn, highlight the effect of closer families of protecting their children from high-risk activities (e.g. substance abuse) by facilitating their involvement in other more positive activities. Perceived closeness between parent and child was a strong predictor of youth well-being scores in the study by Jokinen-Gordon (2007); however it was not possible to elucidate whether this association was due to family social capital *per se,* or it was the result of parents spending more time with their children.

These pathways seem coincident with the work done on family functioning and health outside the social capital approach. Family cohesion, one of the most studied dimensions of the family environment –especially from the fields of mental health and behavioral sciences, has been shown to have an important impact on different aspects of health through mechanisms such as informal control of health-related behaviors, sense of belonging and secure attachment (see Landale, McHale, and Booth 2013, and Martin, 2008, among many others).

8.4.3. The measurement of family social capital

Table 3 illustrates the items and constructs used in the different studies that examined family social capital. Measures to capture family social capital vary to a great extent, depending on authors' definition, their notion of family, and the life stage of the respondent. In addition, similar items are used differently across studies, to the extent that the same particular item was used to measure different constructs depending on the author. For instance, the frequency of talking with family members about personal things is categorized as "family connections" by Li and Delva (2012), as "quality of parent-child relationship and adult interest" by Rothon, Goodwin and Stansfeld (2012), as "parental involvement" by Pettit et al. (2011) and as "family sense of belonging" by Morgan and Haglund (2009).

Also, as noted by Kawachi et al. (2014) a certain degree of overlap exists between the constructs used by the social cohesion and network approaches, and we may further add that this also happens with regard to the subscales. With the intention to systematize the measures employed to assess family social capital, we present in Table 3 the different items used in the papers.

Table 2.

*Characteristics of the 29 papers reviewed and measures used to assess family social capital grouped according to different constructs and subscales widely applied in the study of social capital and health***.**

	Paper	Country	Sample	Health-related outcomes	SC Conceptualization	Family Conceptualization	Constructs	Items
1	Litwin, H. & Stoeckel, K.J., 2014	16 European countries	28,697 persons aged older than 65.	Well-being	Collection of social contacts that give access to social, emotional and practical support	Couple, children, relatives.	Network extent	Name generator in response to the question "Looking back over the last 12 months, who are the people with whom you most often discussed important things?"
							Network composition	Type of relationship: a) spouse or partner, b) children, c) other family, d) friends, e) others.
							Proximity	Proportion of members living within 5km of the respondent's residence.
							Frequency of contact	Daily, several times a week, about once a week, about every two weeks, about once a month, less than once a month
							Emotional closeness	Proportion of cited persons with whom the respondent felt very or extremely close.
2	Dufur, M., Parcel, T. & McKune, B., 2013	United States	10,585 students	Adolescent alcohol and marijuana use	Following Coleman (1990), resources that inhere in the relationships among actors and that facilitate a range of social outcomes.	Parents and children	Interconnection	- How often students discuss (a) school programs, (b) school activities, (c) school classes. - How often parents check home-work.
							Trust	- How much do you trust your children?
							Parental interaction with school	- Parental attendance at parent-teacher meetings - Parental attendance at school events
3	Widmer ED, Kempf N, Sapin M, Galli-Carminati G., 2013.	Switzerland	48 individuals (24 young adults with mild intellectual disability and psychiatric disorders and 24 young adults with mild intellectual disability but without psychiatric disorders)	Psychological adjustment	Relational resources embedded in social networks that are mobilized in purposive actions.	List of persons considered as significant family members by the respondents at the time of the interview.	Family ties	Using the Family Network Method, participants are asked to provide a list of persons that they consider as significant family members at the time of the interview.
							Emotional support	"From time to time most people discuss important personal matters with other people. During routine or minor troubles, who would give emotional support to X?" *(all individuals included by the respondent in his or her list of family members were considered one by one)*
4	Eriksson U, Hochwälder J, Carlsund A, Sellström E., 2012.	Sweden	3,926 11-15 years-old children	Subjective health complaints Subjective well-being	Social capital refers to people's participation in social networks and associations, and the norms of trust and reciprocity that arise from these interactions.	Parents and children	-	- How easy do you find it to talk to your father? - How easy do you find it to talk to your mother?

5	Han, Y., 2012.	Korea	3,449 adolescents	Health-risk behaviors	Following Coleman (1988), the embodiment of relations between parents and youth.	*Parents and youth*	Parent-youth communication	- Parents and I candidly talk about everything - I frequently speak outside experiences and my thought to parents
							Parental knowledge of youth's activities	- When I go out, parents usually know who I am with. - When I go out, parents usually know what I am doing.
6	Li S, Delva J., 2012	United States	998 Asian Amerian men	Smoking behavior	Features of social life—networks, norms, and trust—that enable participants to act together more effectively to pursue shared objectives. Following Putnam it refers to social connections and the attendant norms and trust.	Referred in the text as a "Family" and "relatives", no further defined.	Family connections	- How often do you talk on the phone or get together with relatives? - How much can you rely on relatives for help with a serious problem? - How much can you open up to family and talk about your worries?
							Family cohesion	10 items evaluating sense of family: - Family members respect for one another - Value sharing among family members - Trust among family members - Loyalty to family - Pride of family - …5 more
							Family conflict (as a lack of SC)	5 items concerning attitude towards one's family: - Personal goals that conflicted with those of the family - Arguing over different customs - Feeling lonely and isolated because of lack family unit - … 2 more
7	Rothon C, Goodwin L, Stansfeld S., 2012.	England	13-14y-old adolescents from 13,539 households.	Psychological distress	Coleman's conceptualisation is used, with some modifications based on critiques which have emphasised the need for some agency to be attributed to young people rather than using parental social capital as a proxy.	Parents	Quality of parent-child relationship/ Adults' interest in the adolescent	- How well get on with (step-) mother/father - How often fall out with (step-) mother/father - How often talk to (step-) mother/father about things that matter to young person - How true it is to say (step-) mother/father likes young person making own decision - How many times have you eaten evening meal with family in last 7 days?
							Parental surveillance	- How often parents know where children are going out in evening, - Whether parents ever set curfew on school nights.
8	Morgan AR, Rivera F, Moreno C, Haglund BJ., 2012.	England, Spain	3,591 15 y-old adolescents	Life satisfaction	The social capital framework used here was adapted from Morrow's original qualitative work exploring the concepts relevance to young people.	Parents	Family sense of belonging	- How often family do things together: watch TV or video; play indoor games; eat meals; go for a walk; going places together; visiting friends or relatives; play sports; sitting and talking
							Autonomy and Control	- How often mother/father let me do the things I like doing, like me making my own decisions, try to control everything I do, treat me like a baby.
							Family social support	My mother/father (asked separately): - is loving; - understands my problems and worries; - makes me feel better when I am upset - helps me as much as I need

9	Lau, M. & Li, W. (2011)	China	1,306 sixth-grade primary school children and their parents	Subjective well-being	Resources embedded in social relations and social structure.	Parents and children	Structural social capital	- Discussing important issues between parents and children - Interpersonal interactions with parents and children
							Cognitive social capital	- Children perceived parent-child relationship - Level of trust with family members
10	Li S, Delva J., 2011.	United States	2071 Asian American adults 2,071	Smoking behavior	*Individuals' objective social network and their subjective evaluation of family and neighborhood environment.*	Referred in the text as a "Family" and "relatives", no further defined.	Social ties with relatives	- Frequency of talk on phone with relatives - Reliance on relatives for serious problem - Open up to relatives to discuss worries
							Family cohesion	10 items: - family members respect one another - share values; - work well as a family -…
							Family conflict	Five items: - argue with family, - personal goals conflict with family -…
11	Litwin H, 2011.	United States	1350 elder	Depressive symptoms	The array of social contacts that give access to social, emotional and practical support (Gray, 2009)	Referred in the text as a "Family" and "relatives", not further defined.	Subjective quality of relationships	- How often can you open up to member of your family if you have a problem? - How often can you rely on them if you have a problem? - How often members of your family make too many demands on you? - How often do they criticize you?
							Structure of social network	- Marital status/cohabitation - Number of children - Number of close relatives
12	Moxley RL, Jicha KA, Thompson GH., 2011.	Philippines	361 adults	Nutrition and health knowledge	Putnam's conceptualization of social capital, as features of social organization such as networks, norms and social trust that facilitate coordination and cooperation for mutual benefit.	Parents and children	Reflections of symbolic bonding	- Are children living away from home? - Are you separated?
							Family Solidarity	- Does your family eat dinner together? - Does your family go to religious services together? - Does your family have birthday parties for children? - Does your family have birthday parties for adults? - Does your family go to the movies together? - Does your family go on picnics together?
13	Pettit GS, Erath SA, Lansford JE, Dodge KA, Bates JE., 2011.	United States	Longitudinal study: 459 children from kindergarten to 24 years old and their families.	Life adjustment outcomes: behavioral adjustment, educational attainment, and arrests and illicit substance use.	Following Furstenberg and Hughes (1995): the complex and variegated social mechanisms that parents gamer to advance their children's chances of success.	Parents	Global relationship quality	- From 1 to 10 rate your relationship with your mother/father relationship (asked separately).
							Support from parents	- How much does your mother/father provide for your emotional needs? - How much does your mother/father take care of your practical needs? - How much does your mother/father act as an advisor/mentor?
							Parental involvement	- How often does your mother/father talk with you about ordinary daily events in your … and 6 more items

14	Bala-Brusilow, C., 2010	United States	102,353 children	Childhood obesity	Resources accrued and/or accessed from social relationships/social bonds at multiple levels including the individual, family, neighborhood, community or nation.	Household	Family structure	- Family structure in the household (two parent biological/adoptive family; two parent step family; single parent/other)
							Family size	Number of persons under the age of 18 living in the household
							Family eats together	Number of days during the last week that the family ate at least one meal together
							Parent know child's friends	Proportion of child's friends that parent has met
15	Farrel, C. (2010)	United States	3,150 youth	Suicidal behavior	Set of resources derived from social relationships that allow individuals to implement and accomplish otherwise elusive tasks.	Parents and youth	Parental warmth	About respondents mother and father: - I usually count on her/him to help me out if I have some kind of problems. - She/he usually keeps pushing me to do my best in whatever I do - We do fun things together - She/he usually helps me if there is something I don't understand - When she/he wants me to do something, she/he usually explains the reasons why - She/he spends time just talking with me.
16	Litwin H, Shiovitz-Ezra S., 2010.	United States	1,462 old adults	Well-being, as measured on three separate constructs: loneliness, anxiety, and happiness.	The array of social contacts that give access to social, emotional, and practical sup-port, according to Gray (2009)	Couple, children, relatives.	Network type	- Marital status - Number of children - Number of close relatives
17	Wu Q, Xie B, Chou CP, Palmer PH, Gallaher PE, Johnson CA., 2010.	China	5,164 11-19 years-old adolescents.	Depressive symptoms	Following the seminal work of Coleman, social capital refers to the resources inherent in social relationships that facilitate a social outcome.	Parents and siblings	Quality of parent-child relationship	- On days when no adult is home after school, how many hours are you at home without an adult there? - How many days a week do you eat dinner with your parents?
							Parental monitoring	- Are you allowed to go out with friends that your parents don't know? - How often do your parents check whether you've done your homework?
18	Ferlander S, Mäkinen IH., 2009.	Russia	1,190 adults	Self-rated health	Resources accessed through personal social contacts.	Referred in the text as a "Family" and "relatives", not further defined.	Informal family social capital	- Marital status: a) Married (or cohabiting) b) non-married (divorced, widowed or single) - Do you tend to visit relatives?

19	Keating N, Dosman D.	Canada	2,407 adults aged 65 years and older	- Care assistance	Relying on Putnam's conceptualization: the resources or ''stock'' developed over time through trust and norms of reciprocity which facilitate coordination and cooperation for mutual benefit.	Referred in the text as a "Family" and "relatives", not further defined.	Network structure	- gender composition (proportion of the care network comprised of women) - age composition (proportion of the care network between 45 and 64 and proportion of the care network over 65); - relationship composition (Lone spouse, children at home or spouse and children) - proximity (proportion of the care network residing with the senior recipient and proportion of the care network more than 1/2 day's travel away from the senior recipient); - employment (proportion of the care network employed full or part time); - Network size (number of members of the care network)
20	Morgan A, Haglund BJ., 2009.	England	6,425 young people aged 11, 13 and 15.	- Self-reported health and wellbeing - Health-promoting behaviors - Risk taking behaviors (two)	The social capital framework used here was adapted from Morrow's original qualitative work exploring the concepts relevance to young people.	Parents and children	Family sense of belonging	How often do you do the following activities together with your family? - Going for a walk - Sitting and talking about things - Visiting friends and relatives - Going places
							Parental control	Father/mother asked separately: - How often does your mother or father try to control everything you do?
21	Bassani, C. (2008)	Japan	6,985 respondents	Self-rated health	Social relationships	Parents, children and grand-parents (3 generations)	-	- Number of children parent has - Living in multigenerational homes
22	Berntsson, L., Köhler, L. & Vuille, J.C. (2007)	Nordic countries	10,291 children in 1984 and 10,317 children in 1996	Psychosomatic complaints	Networks, norms and social trust that facilitate co-operation for mutual benefit and stengthen social cohesion	Parents and children	-	- How often do you, spouse/partner and the child play games together?
23	Glendinning A, West P., 2007.	Russia	637 15-21y-old youth	Mental health and SRH, self-worth, depression.	Not described	Parents and children	Feelings of support	e.g. my parent/s understand my problems and concerns
							Control	e.g. my parent/s try to control everything I do
							Autonomy	e.g. My parent/s like me to make my own decisions
24	Gonsalves, L. (2007)	United States	1983 adolescent	Alcohol use, depressive symptoms and global health ratings	Resources established through relationships	Referred in the text as a "Family" and "relatives", not further defined.	Bonding/ Structural	- Household roster - How far in school did mother/father go? - What kind of work does mother/father do?
							Bonding/ Cognitive	- How much do you feel that people in your family understand you? - How much do you feel your family pays attention to you? - How close do you feel to mother/father? - Number of things have talked with mother/father about in the past four weeks. - Number of activities have done with mother/father in the past four weeks.

25	Jokinen-Gordon, H. (2007)	United States	2003 National Survey of Children's Health	Well-being	[Family social capital] Bond between youth and their parents, encompassing, the time, efforts, resources and energy that parents invest in their youth, following Coleman (1988)	Parents and youth	-	- How close parents perceive their relationship with the youth. - Number of times in the past week that all members of the family have eaten a meal together.
26	Kirst, M. (2007)	Canada	80 drug users	Drug-use related health behaviors	Coleman's individual-level definition of social capital, incorporating elements of Burt's (2001) and Lin's (2001) conceptualizations.	Not specified	Structure of social networks	- Name and resource generator type questions regarding: size, density, type, multiplexity and closeness. e.g. How often do you see (name) in person? e.g. How often does (name) do a favor for you?
							Resources in social networks	- Name and resource generator type questions regarding social trust, social support (emotional, financial, informational), social learning and social norms/informal control: e.g. Do you know anyone who can help you if you overdose on drugs? e.g. How often do you share needles with (name)? e.g. How many times in the last month have you used a needle after someone else had already used it?
27	Helliwell JF, Putnam RD., 2004.	3 different surveys from 49 countries.	Adults	Subjective well-being	Social networks and the associated norms of reciprocity and trust.		-	Marital status Relations with the extended family
28	Runyan et al., 1998.	United States	667 2-5 years-old children	Well-being, develop. skills and behavior.	Benefits that accrue from social relationships within communities and families.	Parents	-	Presence of two parents residing within the home Presence of no more than two children in the home
29	Furstemberg & Hughes, 1995.	United States	252 youth interviewed in a 20-year follow up.	Robust mental health and avoided live birth before age 19, as indicators of young adult success.	The complex and variegated social mechanisms that parents gather to advance their children's chances of success.	Parents	Family cohesion	Do you receive/give emotional support from/to your own mother? Do you see your siblings weekly? Do you see your grandparents weekly? Presence of biological or long-term stepfather at home Parents help with homework How often child does activities with parents Parent's expectations of school performance Mother's educational aspirations for the child Mother's encouragement of child Mother attended school meetings Number of child's friends mother know

Measures used in the **family cohesion approach** include items grouped into four subscales: collective efficacy, informal control, social interaction and sense of belonging.

Only one article in our sample assessed *collective efficacy* as an indicator of family social capital. In their investigation of the association between social capital and smoking behavior, Li and Delva (2011) asked their participants about their perception of working well as a family, as a part of a family cohesion scale. They measured social capital through different measures of individual social connectedness and subjective assessment of family and neighborhood environment (i.e. family and neighborhood cohesion, family conflict). Results of multivariate logistic regression analyses showed increased odds of smoking only for family conflicts or higher levels of connectedness with family members.

Indicators of *informal control* have only been used in studies conducted on adolescents with regard to mental health outcomes. Wu, Xie, and Johnson (2010) and Rothon et al. (2012) conceptualized informal control as "parental surveillance or monitoring" using measures such as the frequency that parents know teenagers are going out in the evening, whether teenagers were allowed to go out with friends parents do not know, and the frequency parents checked teenagers' homework. In both cases, an association was found between high levels of parental surveillance and lower odds of poor mental health and depressive symptoms. In the study by Furstemberg and Huges (1995) the specific relationship between their measure of informal control and mental health is not described, but their results suggest that family social capital is indeed associated with more robust mental health in adulthood.

The dimension most widely measured among the papers drawing upon the social cohesion approach is *social interaction* and they basically capture activities that families (or specific family members) do together. Some of them ask whether certain activities are done in the family (yes/no answer) and others refer to the frequency. Activities here are very diverse and include, among others, sitting and talking, watching TV, going for a walk, going to a concert, going on a picnic, going to the movies, playing sports, working on a project, having birthday parties or eating meals together (Bala-Brusilow, 2010; Berntsson et al., 2007; Dufur, Parcel & Mckune, 2013; Farrell, 2010; Ferlander & Maekinen, 2009; Furstenberg & Hughes, 1995; Gonsalves, 2007; Han, 2012; Jokinen-Gordon, 2007; Lau & Li, 2011; Li & Delva, 2012; Morgan & Haglund 2009; Morgan, Rivera, Moreno & Haglund 2012; Moxley et al., 2011; Rothon et al., 2012; Wu et al., 2010). Morgan and Haglund (2009) did not find a significant association between family social

interaction and life satisfaction in teenagers, but other studies showed a positive effect between doing joint activities with family and health-related outcomes such as overall self-reported health (Ferlander & Maekinen 2009; Morgan et al. 2012), the likelihood of obesity in children (Bala-Brusilow 2010) or the consumption of fruits and vegetables (Morgan et al. 2012). Particularly, having at least one meal a day together was related to better mental health (Rothon et al., 2012), lower odds of depression (Wu et al., 2010).

The last subscale capturing family cohesion is *sense of belonging.* Sense of belonging is a psychological construct that can be defined as "the experience of personal involvement in a system or environment so that individuals feel themselves to be an integral part of that system or environment" (Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992). In the papers we reviewed it has been operationalized through family members' respect for one another, value sharing, trust, loyalty, pride, satisfaction and closeness. In teenagers, when measured by parental relationship satisfaction and parental perceived closeness to the child, it was significantly associated with improved mental health (Rothon et al., 2012) and wellbeing scores (Jokinen-Gordon, 2007). However, research by Li and Delva (2011; 2012), did not show any association between sense of belonging (measured by using a combination of different items, namely value sharing, respect, pride and closeness, among others) and smoking habits among Asian Americans.

Turning to the measures used within the **network approach**, two constructs capture social capital: social networks and social support. Social networks represent the structure and nature of social relationships, while social support denotes the resources embedded in those networks and accessed by members. In addition to the four types of social support commonly described (House, 1981), we have also included in our categorization negative social support, since it was used in several papers. By contrast, none of the studies referred to informational support as a relevant part of family social capital.

Emotional family support was the subscale most widely used to assess social support. Questions about the ease of talking to and relying on family members when facing serious problems or worries, perceptions of empathy and receiving counselling were asked to all age ranges and in general results showed differences in correlations with health outcomes. Eriksson, Hochwälder, Carlsund and Sellström (2012), found in their study on Swedish children that the ease of talking to parents explained about 6% of the variance in subjective health complaints as well as 10% of

the variance in subjective wellbeing, with higher levels of emotional support associated with lower levels of subjective health complaints as well as higher levels of subjective wellbeing. By contrast, Litwin's paper on the association between social network relationships and depressive symptoms among older Americans reported no relation between the perceived family network quality variables and to the presence of a high level of depressive symptoms (Litwin 2011). Introducing a gender perspective, results of a study on smoking behaviors among Asian American by Li and Delva (2011) showed that higher levels of family connectedness (as measured by the frequency of talking on the phone or getting together, the reliance on relatives when having a serious problem, and the possibility of opening up to family members to talk about worries) were associated with *increased* odds of being a current smoker and that this correlation was stronger for women than for men. The authors warn about interpreting these results with caution, arguing that given the cross-sectional nature of the study it is not possible to establish causality between the two variables. However, in line with other literature on the double-edged nature of social capital, it is distinctly possible that being closely connected to other family members may result in a downside to health if others also happen to be engaged in unhealthy behaviors. In other words, social reinforcement is a powerful influence on health behaviors; if your parents are smokers, children who feel close to them may express their solidarity by smoking with them.

Alternatively, Li and Delva (2012) hypothesize that the higher likelihood of smoking found in Asian American women with higher levels of family connectedness may be the result of greater levels of stress rather than a negative effect of emotional family support, since women are more prone than men to share their distress with family members and friends.

Instrumental support refers to the exchange of help, aid or assistance with tangible resources such as labor in kind or cash (Berkman Glass 2000; House 1981). Two of the papers reviewed assessed instrumental support, both among teenagers. Wu et al. (2010) asked whether parents helped children with homework, while the question by Morgan at al. (2012) was much more open-ended: "Mother/father (asked separately) help me as much as I need". In both studies, instrumental support was related with positive health effects, namely fewer depressive symptoms and better life satisfaction. Wu et al. (2010) noted that family social capital had not only a direct effect on depressive symptoms, but it also functioned as an important mediator between contextual factors and this mental health outcome, providing significant clues on how

parents can modulate the effect of family economic conditions, parent's educational attainment and the resources available at the neighborhood.

Negative support was assessed in five of the papers in our sample, conceptualized primarily as the presence of family conflict. Again, studies by Li and Delva (2011; 2012) showed higher odds of smoking in Asian Americans to be associated with family conflict. Studies by Litwin (2011), Litwin and Stoeckel (2014) Litwin and Shiovitz-Ezra (2010) and Widmer et al. (2013) explore how different network configurations relate to psychological outcomes in older and intellectually disabled individuals. They compare the composition of these networks in terms of family members, acquaintances, friends and even professionals, confirming that more diverse networks in terms of their members (i.e. more bridging social capital) provide greater health benefits. Although they asked about family conflict, results were not presented for this variable.

Studies of family networks fall roughly into two groups. One group of studies, following the work by Coleman, considers marital status, the number of adults, and number of children in the household (Ferlander et al., 2009; Furstenberg & Hughes, 1995; Helliwell & Putnam, 2004; Runyan et al., 1998). Another group of studies by Litwin (2014), Litwin (2011), Litwin and Stoeckel (2014) Litwin and Shiovitz-Ezra (2010), Moxley et al. (2011), Keating and Dosman (2009) and Widmer et al. (2013) draw upon network analyses and delve deeper into the study of family ties, also considering dimensions such as density (the number of connections within the network) and centrality (the proportion of connections within the network for which respondent is an intermediary). Concerning the set of papers studying family networks in adults, both the density and diversity of family ties appear to have a positive effect on health. In children, the main measure used has been the ratio of children/adults as an indicator of the availability of parental resources allocated within the family. However, no strong relationships were found between this measure and health outcomes in terms of overall wellbeing or mental health, contrary to the seminal results by Coleman (1988) in the realm of educational achievement.

There are a few items that, in our opinion, do not properly belong to the construct of social capital. For example, the mother's educational aspirations for the child does not seem to be a direct measure of family social capital. While for some they might be understood as an asset which children can benefit from (Furstenberg & Hughes, 1995; Rothon et al., 2012), we are close to Morrow's theoretical model of the relationships between social capital and child welfare outcomes, in which social capital (within and outside the family) is assessed by the extent of

networks, support received from those networks, perceived trust and reciprocity, shared norms and balance of bonding versus bridging social capital (Morrow, 1999). Parental values and norms, as well as parental decisions to invest in their children would be here intermediate variables that can be conditioned by social capital, but would not be social capital *per se.*

Table 3

Measures of family social capital grouped according to different constructs and subscales widely applied in the study of social capital and health.

Construct	Subscale	Items	Adapted from
Family cohesion	Collective efficacy	- Perception of working well as a family	*Li & Delva., 2011.*
	Informal control	- Number of hours children are at home without any adult after school. - Frequency parents know (children) where going out in evening, - Allowance to go out with friends that their parents don't know - Parents know who the children are with when they go out. - Parents know what children are doing when they go out. - Parents setting curfew on school nights. - Number of child's friends mother knows - Frequency parents check whether they've done your homework	*Bala-Brusilow, 2010* *Dufur et al.,2013* *Furstemberg & Hughes, 1995.* *Hay, 2012* *Rothon et al., 2012.* *Wu et al.,, 2010.*
	Social interaction	Frequency of doing the following activities along with family members: - Watching TV or video - Playing indoor games - Doing fun things together - Eating meals/eat dinner - Going for a walk, to the movies, to a concert, on picnic… - Working on a project - Shopping - Playing sports - Sitting and talking (about things, about dates, about school problems…) - Going to religious services - Having birthday parties for children or adults - Talking on the phone (with family or with specific family members) - Visiting relatives (or specific family members)	*Bala-Brusilow, 2010* *Berntsson, Köhler, & Vuille, 2007* *Dufur et al.,, 2013* *Farrel, 2010.* *Ferlander & Mäkinen, 2009.* *Furstemberg & Hughes, 1995.* *Gonsalves, 2007* *Han, 2012.* *Jokinen-Gordon, 2007* *Lau & Li, 2011* *Li & Delva 2012* *Morgan & Haglund, 2009.* *Morgan et al., 2012.* *Rothon et al., 2012.* *Wu et al.,, 2010.*
	Sense of belonging	- Family members respect for one another - Family members get on well - Value sharing among family members - Trust among family members - Loyalty to family - Pride of family - Closeness (to family or to specific family members) - Perception of family paying attention to oneself - Satisfaction of family relationships	*Dufur, Parcel, & McKune 2013* *Gonsalves, 2007* *Jokinen-Gordon, 2007* *Lau & Li, 2011* *Li & Delva, 2011, 2012* *Petit et al., 2011.* *Rothon, et al., 2012.*

Family support	Emotional support	- Facility to talk to family or to specific family members - Facility to open up and talk about worries (to family or to specific family members) - Reliability on relatives for help with serious problems - Receiving counselling (from family or specific family members) - Perception of empathy (from family or specific family members) - Receiving/giving love and warmth (from family or from specific family members)	*Eriksson et al.,, 2012; Farrel, 2010* *Furstemberg & Hughes, 1995* *Glendinning & West, 2007* *Gonzalves, 2007* *Li & Delva, 2011, 2012* *Litwin, 2011* *Morgan et al., 2012* *Pettit et al.,, 2011* *Rothon et al., 2012.* *Widmer et al., 2013.*
	Instrumental support	- Parents helping with homework - Mother/father (asked separately): helps me as much as I need; - She/he usually helps me if there is something I don't understand	*Farrel, 2010* *Kirst, 2007* *Morgan et al., 2012* *Wu et al., 2010*
	Negative support	- Frequency in which family make too many demands - Frequency of critiques between family members - Frequency of arguing - Personal goals conflicting those of the family - Feelings of loneliness and isolation because of lack of family unit	*Li & Delva, 2011, 2012* *Litwin & Sciovitz-Ezra, 2011* *Litwin, 2011* *Widmer et al., 2013.*
Family network	Network structure	- Extension: number of members of the network - Density: Number of connections within the network - Centrality: Proportion of connections within the network for which the respondent is an intermediary.	*Bala-Brusilow, 2010* *Bassani, 2008* *Ferlander & Mäkinen, 2009.* *Furstemberg & Hughes, 1995.* *Gonsalves, 2007* *Helliwell & Putnam, 2004.* *Keating & Dosman, 2009.* *Litwin, 2011.* *Litwin & Shiovitz-Ezra, 2011.* *Litwin & Stoeckel, 2014.* *Runyan DK et al. 1998.* *Widmer et al., 2013.*
	Quality of family ties	- Gender composition - Age composition - Relationship composition (Lone spouse, children at home, spouse and children, close relatives, step-parents) - Proximity: proportion of cited persons living within a specific distance range. - Frequency of contact - Emotional closeness: proportion of cited persons with whom the respondent feel very or extremely close - Employment	*Bala-Brusilow, 2010; Bassani, 2008.* *Ferlander & Mäkinen, 2009.* *Furstemberg & Hughes, 1995.* *Helliwell & Putnam, 2004.* *Keating & Dosman, 2009* *Kirst, 2007; Litwin, 2011* *Litwin & Sciovitz-Ezra, 2011* *Litwin & Stoeckel, 2014.* *Runyan et al. 1998.* *Widmer et al., 2013.*

8.4.4. Conclusions on the conceptualization and measurement of family social capital in health sciences

The present review is, to our knowledge, the first attempt to systematize the study, conceptualization and measurement of family social capital in the health sciences. With the growing interest in the effects of social capital on health and the recognition that the social capital embedded in different contexts is associated differently with health outcomes, we suspect that more research on how family social capital affects health is long overdue.

Of course, there is a large body of research on family functioning and health from disciplines such as Psychology and Social Work, but the approaches notably tap into different elements of family life. These divergences become evident when one explores two of the most widely used questionnaires to assess family functioning in Psychology: the *Family Adaptability and Cohesion Evaluation Scale, FACES* (Olson, Sprenkle, & Russell, 1979) and the *Family Environment Scale* (Moos & Moos, 1994). Family cohesion is a central element in both approaches, but they clearly differ in their attention to dimensions such as adaptability, communication and parental styles –highlights from the psychological point of view-, or social networks and social support from the social capital perspective.

It has been almost two decades since Coleman first introduced the notion of family social capital; yet in the field of public health, most of the attention has been devoted to neighborhood social capital (and more recently, workplace social capital). Some limitations of Coleman's initial conceptualization have been noted and overcome, such as his narrow focus in seeing family social capital as something that flowed uni-directionally from parents to children. Still, other questions remain to be figured out. Authors like Morrow (1999), Harpham and colleagues (Trudy Harpham et al., 2002) and White (2008) have argued persuasively for considering children as active agents within the social capital discourse. Also the family social capital of adults and the elderly is increasingly being studied. Nonetheless, there is still a lack of recognition of social capital provided by siblings. This is a tendency with roots in Coleman's work, in which a greater number of children was interpreted as diluting parental attention, thus diminishing the resources available to them. In contrast to this view, siblings can play an important role in family social capital from childhood to adulthood by increasing the network size and substituting for resources that parents may not be able to offer in different stages of life, from help in doing homework, to cash loans or emotional support. Above all, a life-course approach needs to be

adopted in the study of (family) social capital, as factors influencing health behaviors are expected to operate distinctly at different stages of life (Coleman, 1988; Laub & Sampson, 1993; Rackett & Davison, 1995).

The mechanisms through which family social capital promotes (or hinders) health behaviors and outcomes is something that needs to be further investigated. A good starting place is to consider the mechanisms that have been put forward for social capital in other contexts, such as neighborhoods. From childhood, families provide instrumental and affective-cognitive support that will influence children's health and well-being beyond adolescence (Norton, Froelicher, Waters, & Carrieri-Kohlman, 2003; Schor & Menaghan, 1995). In adulthood, more cohesive communities – and the same could be expected from family- help their members to cope with stressful situations, can be a significant source of information influencing health and can shape health-related behaviors through informal control and peer influence. Mixed results on the effect of peer influence have been identified for different health behaviors. Christakis and Fowler found that obesity has a contagious effect through social networks –increasing the odds of being overweight when people to which one is connected is obese (Christakis & Fowler, 2007), while the effect is the opposite with regard to smoking cessation: when an individual stops smoking there is an increase in the probability that his close contacts will stop smoking too (Christakis and Fowler, 2008).

There is also an urgent need to understand the downside of family social capital. Portes and Landolt (2002) put light into the so called "dark sides" of neighborhood social capital, which included in excessive demands by the members of cohesive groups, restrictions on individual freedom, exclusion of out-group members, and the down-levelling of members' aspirations. In our reviewed papers only Litwin (2011) tried to capture some of these downsides, but it seems likely that family social capital – like other forms of social capital – can have both health-promoting and health-damaging aspects.

In summary, our findings are consistent with the notion that family social capital is multidimensional and that its components have distinct effects on health. Yet, much work remains to be done to determine the most valid ways to measure family social capital.

Ultimately, a social capital approach may shed light on how the family is a critical context that lies between the individual and more upstream contexts, including neighborhoods and the state, and can provide clues to develop upstream politics for healthier environments. As noted by

Litwin and Stoeckel (2014), since notable differences exist in the family dynamics among countries, family social capital could also be an added element to take into account when explaining cross-country health differences.

9. Concretion of the former theoretical framework to adolescence

9.1. Adolescence

Adolescence begins with the onset of physiologically normal puberty and ends when an adult identity and behavior are accepted. According to the WHO (2015), it is the time span between 10 and 19 years old. Adolescence is characterized by substantial modifications of the organism, with an increase in the growth rate and the body mass, as well as other morphological changes due to sexual maturation. At a psychosocial and cognitive level, it is also the period in which individuals move from concrete thinking to abstract and complex cognition and develop a post-conventional morality. Adolescents' development is typically divided into three stages marked by maturational changes as well as by the mastery of different emotional, cognitive and social skills, mainly related to the pursuit of an independent identity and acceptancy by the peers (Casas, 2006; Pressley & McCormick, 2007; Ros et al., 2001).

Early adolescence (10-13 years old) is characterized by the beginning of sexual development and increased growth. At a psychosocial level, they become aware of their individuality and begin to differentiate themselves from parents and other adults at the same time that there is a strong peer effect, especially with those of the same gender. In terms of cognition, they are still orientated towards concrete operations and linear thinking. At this stage, adolescents have a tendency to think of food in terms of either healthy or unhealthy and research shows how they associate unhealthy food to have fun and fit in with a group, whereas healthy eating is associated with home-based meals and family (Shepherd et al., 2006). During this period, adolescents also become more autonomous from family and school in relation to their diet, and start making their own meal and snack choices. Body image turns out to be a critical element when it comes to relating to others, which together with the huge social pressure for thin, athletic bodies places adolescents at a greater risk for eating disorders (Smink, van Hoeken, & Hoek, 2012).

Physical development is normally completed during middle adolescence (14-16 years old). In fact, this is the most intense period of growth and sexual-related morphological changes take place. Abstract thinking starts to emerge during this period, but these skills are not mastered yet. Teens at this stage begin to understand the relationship between lifestyle and health, but the acknowledgment that unhealthy food may be detrimental in the future is not a strong enough argument, since they are mainly present oriented. Self-image remains an important issue and greatly affects food choices and lifestyle.

The main characteristic of late adolescence (17-19 years old) is the development of a strong identity. At this stage, relationships with the group become less important than individual and intimate relationships. Teens have a greater awareness of future and the consequences of their acts, and are more capable of handle complex social situations and impulsive behaviors. Growth slows and, in some cases, adult physical appearance is reached.

Several authors and organizations (Canadian Pediatric Society, 2003; Pressley & McCormick, 2007; WHO, 2015d), recognize that the changes described above occur at different paces for individuals, and that, consequently, age is not the best indicator to differentiate these periods, in spite of its convenience and practicality of use. Although age can be appropriate to monitor biological changes, social transitions highly depend on the sociocultural environment, and changes do not come suddenly, but rather gradually. In general, though, it is accepted that early- to mid-adolescence constitute a particularly challenging period due to the significant changes that young people have to deal with in their lives.

9.2. Adolescent's health, obesity, lifestyle, dietary habits.

Childhood and adolescence constitute critical periods in an individual's life. Since the 1990's, lifecourse epidemiology has provided great bases to understand etiologic periods (Berkman & Kawachi, 2014). Three main models have been described: critical periods, accumulation and pathways (Blane, Netuveli, & Stone, 2007). *Critical periods* have been defined as specific stages during which exposure to certain elements can have reverberant effects whose consequences may not be possible to revert, even years later. In contrast, the *accumulation model* defends that adult health is the result of the accrual of a lifetime of exposures to different risks. Last, the *pathways* approach does not only include health-related events. Rather, it should be understood

as the result of an interrelated relationship between health exposures and the social factors that can be both cause and consequence of them. Either way, what happens during the early years of life has an important impact in future life, not only in terms of health, but also in educational attainment, social engagement and all life's dimensions, in general.

A recent report from the Population Reference Bureau identified adolescence as "the last best chance to build positive health habits and limit damaging ones," given the fact that "minimizing risk factors for NCDs, particularly during adolescence, offers the opportunity for better health, more years of productivity, and lower health care costs" (Baldwin & Amato, 2012). This statement is supported by other scholars such as Gore et al. (2011), Patton et al. (2012) or Sawyer et al., (2012).

When compared to adults or children, information systems with regard to adolescents' health are much more modest. Probably due to this lack of data, youth are typically regarded as healthy. Yet, many risks factors that are prone to lead to NCDs in adult life such as tobacco,

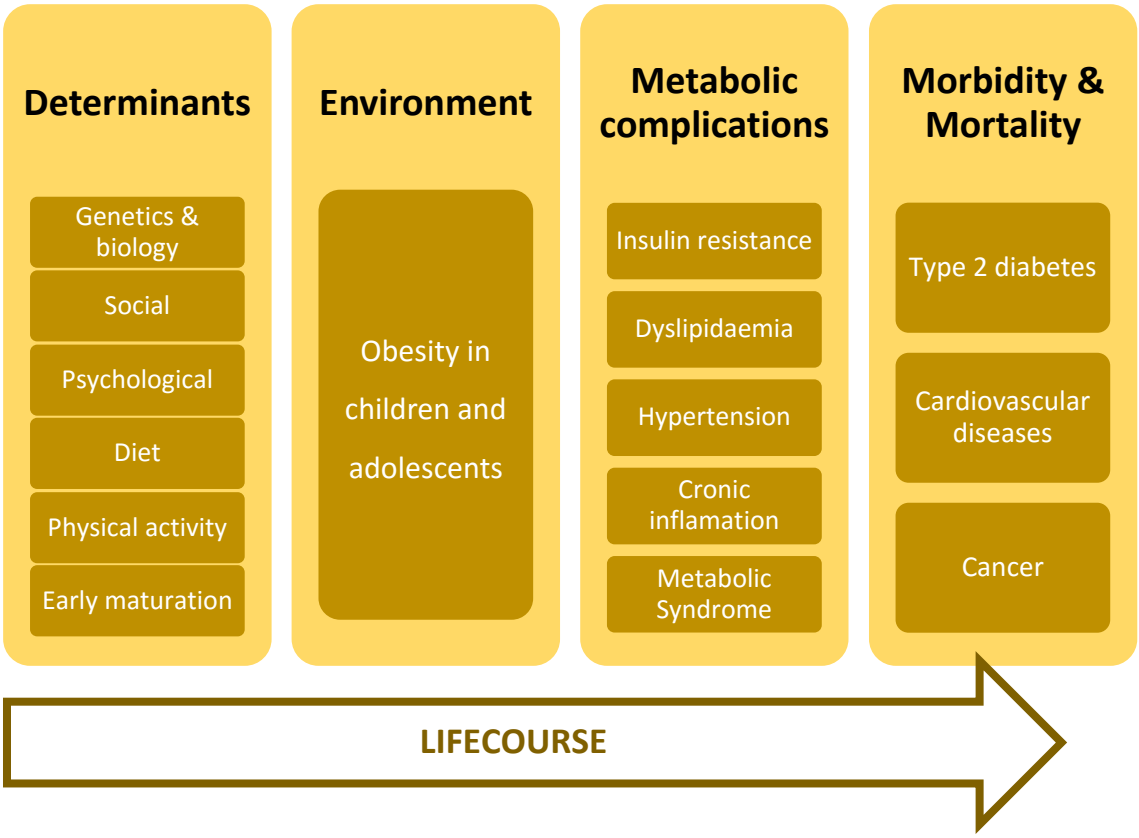

Figure 2. Factors influencing the risk of obesity and related metabolic consequences and health outcomes through a lifecourse perspective. Adapted from Moreno, Pigeot, & Ahrens, 2009.

alcohol or other drugs' consumption, lack of physical activity, unhealthy dietary habits or obesity are developed at this stage (see Figure 2). In 2008, there were more than 1.8 billion youth aged 10 to 24 worldwide, a number that is expected to rise close to 2 billion in 2032. The magnitude of this age group urges researchers and governments to intensify the investment made to better know their health status, behaviors and determinants, not only with views to future health, but also for social and economic development (Gore et al., 2011).

Overall, excess weight and its associated comorbidity is one of the most important threads to adolescent and future adults' health. WHO estimates are that in 2013, 42 million children were affected by overweight or obesity in 2013 and that, if current trends continue, 70 million children will be overweight or obese by 2025 (WHO, 2015b). Prevalence of childhood obesity is higher in high-income countries. However, in absolute numbers there are more children with excess weight in low-middle income countries, and the growing rates in the latter is particularly worrying. Along with the target of 0 increase in obesity/diabetes prevalence by 2025 set by the 2013 World Health, the 2015 interim report of the Commission on Ending Childhood Obesity establishes a number of strategic recommendations for governments, the private sector, and civil society and NGOs to work towards achieving this goal (WHO, 2015c).

Roughly, their proposal consists of a comprehensive approach that extends beyond mere education and involves different agents at the individual, social and environmental levels. While this goal is not new –it has been recognized by multiple institutions and reports including the WHO's Global Strategy on Diet, Physical Activity and Health (2004), the European Charter on Counteracting obesity (2006), the EU Action Plan on Childhood Obesity 2014-2020 (2014), the European Commission White Paper "A strategy on nutrition, overweight and obesity-related health issues (2007), … and many others at national level such as the Spanish NAOS Strategy (2005)-, what this interim report adds is a layout of the specific objectives and actions to be undertaken by different actors and stakeholders that should lead to the accomplishment of this goal. Among them, there are specific recommendations to tackle the obesogenic environment by promoting healthy eating and more active lifestyles, as well as a particular focus in critical stages of the lifecourse, such as preconception and pregnancy, young childhood and adolescence. Some of the policy options with regard to this last target include the modification of school and neighborhood environment so that access to healthy food is promoted in front of unhealthy options, the engagement of families, caregivers and the whole community, the creation of partnerships between the education and health sectors, as well as the engagement

of children and adolescents themselves to develop and implement actions to reduce obesity rates. In any case, child and adolescent obesity are only "part of a bigger picture" (Lobstein et al., 2015) and the whole environment, including agriculture, food supply and *healthy* economic growth policies need to be tackled if we are to reverse childhood and adult obesity trends.

Interestingly the WHO interim report also identifies research gaps that need to be unraveled to develop stronger evidence-based answers. These research gaps are grouped in five categories comprising (1) childhood obesity and NCDs; (2) Economic consequences of childhood obesity; (3) psychosocial determinants of childhood obesity; (4) preconception and pregnancy interventions and (5) prevention and treatment of obesity in children and teenagers. Among the 21 highlighted items under each of these headings, one of them is particularly relevant for this dissertation, namely: "Further evidence on the psychosocial determinants of overweight and obesity, in particular the gendered differences, health knowledge among caregivers and children, impact of peers, social networks and media on diet, physical activity behaviors (WHO, 2015c, p. 24)

As in the case of adults, an imbalance between *energy in* and *energy out* lies behind the development of excessive adiposity. Diet and physical activity are the closest behavioral factors influencing this ratio, but at the same time, important environmental elements conditions what one eats and how much one moves. Next, we resume the most relevant data about the diet, physical activity, psychosocial and environmental elements that lie behind the rise in the obesity trends for adolescents.

The HELENA study is one of the most relevant researches conducted around lifestyle and nutrition during the adolescence (Diethelm et al., 2012; Moreno et al., 2010, 2014, among others). This EU-funded project, has provided data about body composition, dietary intake, nutrition knowledge, attitudes, food choices and preferences, blood markers profile, genotype and physical activity of more than 3,500 13-16 year-old adolescents across Europe. Overall, food intake was not aligned to food-based dietary guidelines. Fruit and vegetable consumption was half of the recommended. Dairy products intake was also low, whereas meat products, fats and sweets were over-eaten. In line with the high consumption of over-processed products, saturated fatty acids and salt intake was high. On the contrary, polyunsaturated fatty acids intake was low.

A further relevant finding of the HELENA study was the different patterns of dietary intake and overall lifestyle behaviors with regard to gender and SES indicators. In this direction, adolescents from southern Europe were most likely to be influenced by socio-economic factors (Hallström et al., 2011). We suggest that, as seen in the case of the variations of social capital across countries with different political regimes and cultural relationships, these differences may reflect broader structural and institutional influences.

Findings of the HELENA study were consistent with another large study investigating the dietary patterns of adolescents. In this case, Cutler and colleagues developed a follow-up study which included a sample of 4,746 US adolescents (Cutler, Flood, Hannan, & Neumark-Sztainer, 2011). They included two measures of dietary intake five years apart, which allowed investigators to identify how diet changed over the transition to adulthood, and described four types of patterns: vegetable and fruit, fast food, starchy foods and snack food. Fast food and snack food patterns were associated with higher obesity prevalences, which is consistent with other studies (Ambrosini et al., 2012; Moreno et al., 2010). In prospective analysis, their results indicated that SES, family meal frequency and home availability were positively associated with the vegetable and fruit and starchy food patterns and inversely associated with the fast food pattern. Maternal, paternal, and peer support for healthy eating were positively associated with the vegetable and fruit pattern and inversely associated with the fast food pattern. Thus, social relationships in different settings appeared to be of greatest relevance for adolescent dietary habits, with the permission of the most important determinants of adolescent health and eating behaviors worldwide, which are structural factors such as national wealth, income inequality and access to education (Patrick & Nicklas, 2005; Viner et al., 2012).

With regard to other lifestyle dimensions, HELENA's results showed that adolescents spent, on average, nine daily hours of their waking time on sedentary activities, with variations being associated with age, media availability in own bedroom, sleeping time, breakfast consumption and season. Sedentary time was associated with cardiovascular risk factors and bone mineral content. In both sexes, waist circumference and sum of skin folds were inversely associated with consumption of dairy products and directly associated with cardiorespiratory fitness.

Another study investigating the correlates of physical activity in children and adolescents is that of Sallis, Prochaska, & Taylor (2000). In their paper, the authors review the evidence around the factors that influence the practice of physical activity. Their results indicated that gender (male),

ethnicity (white), age (inverse), perceived activity competence, intentions, depression (inverse), previous physical activity, community sports, sensation seeking, sedentary after school and on weekends (inverse), parent support, support from others, sibling physical activity, direct help from parents, and opportunities to exercise were significantly correlated with physical activity.

Apart from the HELENA study, the enKid (1998-2000) and AVENA (2000-2003) studies, had previously shed light on the health status and its diet-related behaviors in Spanish adolescents. It is worth mentioning that since the AVENA study, more than 10 years ago, no study has investigated the lifestyle and dietary habits of adolescents in a representative sample of Spanish youth. In this way, while different waves of the ALADINO study (as a product of the COSI[3] device in Spain) have been conducted on primary school children, data on adolescents is, once more, scarcer.

The enKid study revealed the bad quality of the diet of Spanish children and adolescents. Less than 45% of the youth 15-24 years-old met the requirements for a healthy diet according to the KIDMED index, a 16-item scale that measures Mediterranean Diet Quality (Serra-Majem et al., 2004). Specific points of concern were the low intake of a 2nd portion of fruit or vegetables (achieved by less than 60% of the adolescents), the fact that almost half of the sample did not eat a cereal product in their breakfast, the low intake of nuts (only 29.3% ate them at least 2-3 times per week), the high consumption of red meat and processed meats, or that one in four teenagers ate candies more than once a week.

Several demographic and socioeconomic patterns were observed in this study as well. North-eastern adolescents had, in general, better scores than the rest of regions (52% reflecting optimal Mediterranean diet quality). In agreement with a big body of literature, a socioeconomic gradient was found when measured both by family income and by maternal education, indicating slightly better dietary habits among high SES adolescents (Aranceta et al., 2003b).

With regard to physical activity, results showed that 70% of Spanish youth 2-24 years-old do not engaged in active activities during their leisure time, especially girls. Children 10-13 showed the highest rates of physical activity practice, which decreases with age, especially for women.

[3] Childhood Obesity Surveillance Initiative, promoted by the WHO Regional Office for Europe in order to develop harmonized surveillance systems, providing measured and comparable data on rates of overweight/obesity among primary-school children.

Physical inactivity was also related to family SES and mother's educational level (Roman-Viñas, Serra-Majem, Barba, Pérez-Rodrigo, & Bartrina, 2006).

The AVENA study was conducted in a sample of 2.859 13-18 years old adolescents, which were representative of the Spanish population in terms of gender and age (Moreno et al., 2005). In the overall sample, diet was characterized by a low consumption of carbohydrate, along with a high intake of fat. Monosaturated fat intake was adequate, while saturated fat was consumed in excess. Fiber consumption was low, although it was associated with better anthropometric outcomes (BMI, % body fat) in both boys and girls. Excess weight was found in 25.69% of the males and 19.13% of the females. Interestingly, it only showed a significant correlation with SES in males. With regard to physical condition indicators, Spanish adolescents showed lower muscular strength and aerobic capacity than their European peers, which is consistent with the decrease in the levels of physical activity practice.

Looking up to the social determinants of obesity in adolescents, different studies highlight their effect on the weight status, eating habits and physical activity levels in Spanish adolescents. Beyond the SES influences found in the enKid and AVENA studies and explained above, a socioeconomic gradient in obesity in youth was also found in studies by Sánchez-Cruz et al (2013) and Font-Ribera et al. (2014), among others. In their review of social inequalities in child and adolescent health in Spain, Font-Ribera and colleagues highlight some of the limitations to understand how social determinants shape youth's health. With regard to obesity, they refer to a lack of transparency in describing the results (for example, in most cases the measure of SES was not reported), poor statistical analysis along with a lack of age stratification. Moreover, they add that, despite the fact that they followed Coleman's model to assess social determinants, social constructs were not included in their review due to the lack of data in the studies included in the review, which could hinder the interpretation of social inequalities at these ages.

A further potential determinant of obesity and its related behaviors is the fact of living in a rural or urban environment. In Spain, despite the fact that between 20-35% of the population lives in a rural context (MARM, 2009), very few studies have examined how it influences obesity, dietary habits and physical activity. The enKid study found a better intake adequacy among youth living in urban areas, when compared to smaller or rural localities (Aranceta et al., 2003b). According to the same study, however, youth under 14 years-old living in urban areas exhibited higher rates of obesity than their urban peers. These results contrast to the obtained by Grao-Cruces

and colleagues, who found a better adherence to the Mediterranean Diet among rural adolescents, although, there were not significant differences on BMI based on the KIDMED scores (Grao-Cruces et al., 2013). Coronado-Vazquez et al. (2012), in turn, reported a higher prevalence of obesity in rural areas, especially in locations with less than 5,000 inhabitants. As we can see, Spanish data do not reveal consistent patterns of obesity and dietary habits among rural or urban adolescents. However, it has been suggested that socioeconomic confounders could lie behind these differences (Mathieson & Koller, 2006).

Last, at the family level, different factors of the family environment have been associated with obesity and dietary habits, beyond the genetic component (Birch & Davison, 2001; Savage, Fisher, & Birch, 2008). Most of the research on family determinants of youth eating patterns, though, has been conducted in children, and while most of the effects seen at younger ages seem to be maintained through adolescence, the quest for an individual identity and the usual distancing from family during this stage in comparison with the close nature of this bond during childhood also appears to affect family's influence on teenagers eating habits. In general, food choices are differently influenced by family and peers depending on the age and gender of the youth (Pedersen, Grønhøj, & Thøgersen, 2015; Salvy, Elmo, Nitecki, Kluczynski, & Roemmich, 2010).

Research indicates that while family may not be determinant on promoting the intake of healthy food, it has an important role in preventing the consumption of unhealthier products. Salvy and colleagues (2011), for example, compared parental and friends' influences on primary and secondary school children and they reported that while parental presence inhibited youth of all ages from eating unhealthy foods it did not encouraged healthy foods' intake, eating alone or in presence of friends motivated the consumption of highly palatable (and unhealthier) products, at all ages and especially in boys. Adolescent females tended to regulate their intake towards healthy foods when in presence of other female friends.

Social influence is not the only way in which families can influence youth's eating behaviors and choices. Structural aspects such as mealtime structure, food availability, and the size of the portions provided by the family, as well as psychological reinforcement, family cohesion and family norms and values around health, food and body have been found to be important determinants of children's eating patterns and diet quality (Berge, Arikian, Doherty, & Neumark-sztainer, 2012; Patrick & Nicklas, 2005; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007).

9.3. Evidence on social capital and adolescence health

More research on the influences of social capital on adolescent health has been claimed from several sources (Font-Ribera et al., 2014; Harpham, 2010; Morgan, 2011; Morrow, 1999; White, 2008). Studies of social capital in youth typically include both children and teenagers and do not take into account the significant differences between these two life-stages. In 2006, Kristin Ferguson issued a review examining the evidence about social capital and children's wellbeing published between 1980 and 2002. It is important to note that not only were health-related studies included, but educational and psychosocial outcomes were taken into account as well. Her conclusions were that despite the methodological limitations of the studies reviewed, there was enough evidence to "indicate that family and community based interactions and relationships have a positive effect on children's overall wellbeing, and, similarly, of all predictive factors associated with children's wellbeing, social capital – second only to poverty- has the highest influence on children's development and attainment of future outcomes" (Ferguson, 2006, p. 9).

As explained in previous sections, Morrow was a pioneer in turning the look towards children's social capital, arguing that they are not only passive receptors, but already competent beings, capable of generating and using social capital in their own right (Morrow, 1999). Studies exploring the associations between youth health and social capital tend to focus on a single setting such as the neighborhood, school or family. However, as Bassani (2007) argues, youth are embedded in a complex matrix of interrelated contexts that might have an independent and interactive effect on health outcomes. So it is necessary to widen the scoop which adolescents' social capital is looked through.

If studies on social capital and nutrition are scarce, this is even more evident in adolescents. While there are some studies investigating the relationship between social capital and obesity and social capital and physical activity in children and teenagers, the influence of social capital on diet is a hghly unexplored issue. The US National Survey of Children's Health (NSCH) is one of the few examples in which adolescent social capital is measured at the state or country level (Data Resource Center for Child and Adolescent Health, 2015). However, in this survey social capital is defined by an index that measure parents' perceived neighborhood social capital, which could entail potential biased measures of social capital, particularly for the oldest adolescents, whose perceptions of social capital does not necessarily needs to match these of

their parents. These circumstances taken into account, academics using different waves of the NSCH have consistently found social capital to be strongly associated with obesity and physical activity (Duke, Borowsky, & Pettingell, 2012; Nesbit, Kolobe, Sisson, & Ghement, 2014; Singh & Ghandour, 2012; Singh, Kogan, Van Dyck, & Siahpush, 2008; Singh, Kogan, & Van Dyck, 2008).

Cohen and colleagues (Cohen, Finch, Bower, & Sastry, 2006) found an association between neighborhood collective efficacy and BMI in adolescents. In their study, they used adults responses to measure collective efficacy, but their answers were not paired with the different adolescents in the study; rather, they aggregated adult responses by 1990 census track boundaries to create neighborhood measures of social captal (collective efficacy). They hypotesized that this relationship could be explained by several factors, including stress-related metabolic pathways, neighborhood differences in the physical and social environments, or a combination of these two.

Morgan (2011), in a research developed in the framework of the WHO HBSC survey, carried out a comprehensive and outstanding study on social capital and adolescent health, using an asset-based approach. His work addresses some definitional and measurement controversies found in the adult literature on social capital, and also develops a new perspective to understand how it can influence health. In addition to explaining the effects of social capital on health as (1) the result of gaining *social support* through membership in groups, (2) a way to narrow *social inequalities* or (3) a leverage for the poorest to access opportunities that, from a *political economy* perspective, would otherwise be restricted to them; he adds a fourth explanation, known as the *health assets perspective*. It is his posture that social capital can be understood as a resource that, together with healthy family dynamics, proper education, decent housing, community values and adult support among others, it can allow youth to gain problem-solving skills, social competence and a sense of purpose that bring them close to either healthy or risky behaviors (Morgan, 2010). In fact, he not only proposes a newer approach on the relationship between social capital and health, but he develops a whole framework that can help health researchers to situate their social capital studies in terms of perspective, type of social capital assessed, context in which it is embedded and the indicators used to measure it. Figure 3 shows Morgan's Building Block Framework for Social Capital.

Besides the theoretical apportations, Morgan's research provides empirical evidence of the links between social capital and youth, adjusting for socioeconomic conditions and other demographic variables. Specifically, he assessed different dimensions of social capital in relation to self-rated health, life satisfaction, health complaints, fruit and vegetable consumption, soft-drinks consumption, physical activity and sedentary behavior, smoking and drinking. The samples used were 13-15 year-old teenagers from England, Belgium, Canada, Italy, Poland, Romania and Spain, depending on the relationship examined, allowing for interesting cross-

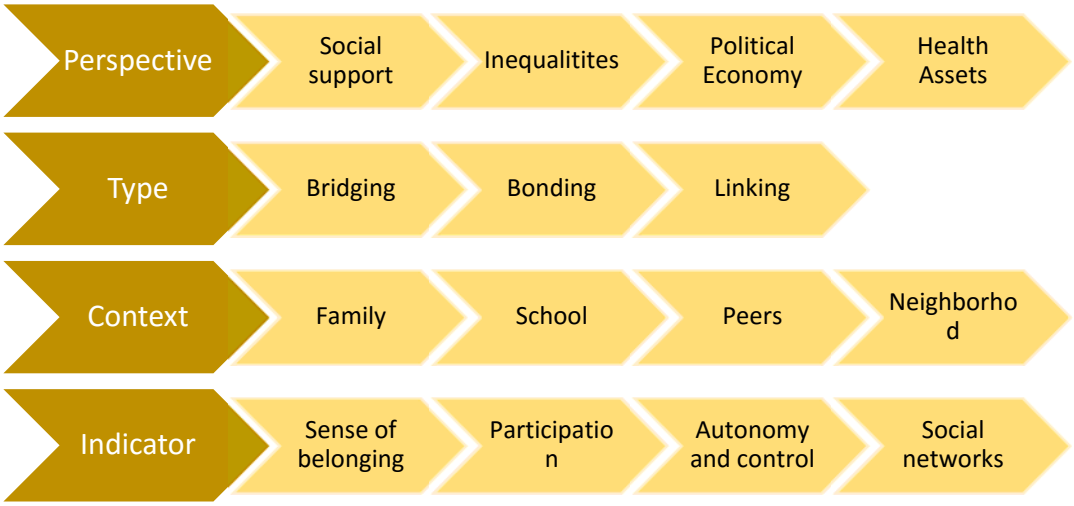

Figure 3. Building Block Framework for Social Capital. Adapted from Morgan, 2010.

country comparisons. Morgan's results indicate that the strength of association varies across the different indicators of social capital and health outcomes studies. The three domains explored in this research, sense of belonging, autonomy and control showed to be independently associated with different health outcomes and ages. For instance, higher notions of autonomy and control become more important as youth age, and it has displayed a protective effect towards smoking, even when a best friend was a smoker.

Participating in social associations is generally related to better health, outcomes, although it is likely that certain types of associations are more beneficial than others. Sense of belonging – especially within the family domain- was, in turn, associated with a higher intake of fruit and vegetables and lower drinking rates.

Other multisetting studies have yielded parallel results: all three, family, school and neighborhood social capital matters to youth's health and have cumulative effects (Dufur et al., 2008; Eriksson et al., 2012). Additionally, social capital has been shown to mediate the relationship between low-income contexts and obesity and smoking behavior. Evans & Kutcher (2011) found in a sample of 196 rural US adolescents that despite the well-stablished association between low-income environments and higher rates of obesity and smoking, youth with higher social capital (as measured by social cohesion, informal control and relations with adults in the community) presented lower rates of these two indicators than others in the same circumstances and that the prevalence of obesity and smoking was, then, similar to those of more affluent adolescents.

Overall, what these studies suggest is that while the family environment is fundamental for children and adolescents' wellbeing, neighborhood and school clima and relationships also have a relevant role, reinforcing the notion that social capital needs to be understood through a multi-setting approach.

Methodology of the empirical work

10. Study design

An observational, mixed methods design consisting of two concurrent studies integrating quantitative and qualitative methods was chosen as the most suitable approach to answer our research questions. On the one hand, we conducted a qualitative study using the multiple-cases study methodology, in which the role of social capital and its relationship with other social determinants of health on the lifestyle, dietary habits and weight status of 33 adolescents from different socioeconomic context was studied in depth. On the other hand, a cross-sectional study with a sample of 259 adolescents from different socioeconomic environments was carried out, with the aim to establish correlations between sociodemographic and social capital variables, and our chosen health-related variables. The data drawn from these two complementary studies enhances the interpretability of assessments of a single phenomenon by providing alternate layers of analysis (Andrew & Halcomb, 2007; Creswell & Plano, Clark, 2011). In this way, the case-studies support and enrich the cross-sectional study by revealing personal views and circumstances that can be omitted when using only survey data, whereas this quantitative data contextualizes the case-studies within a modest sample of similar individuals.

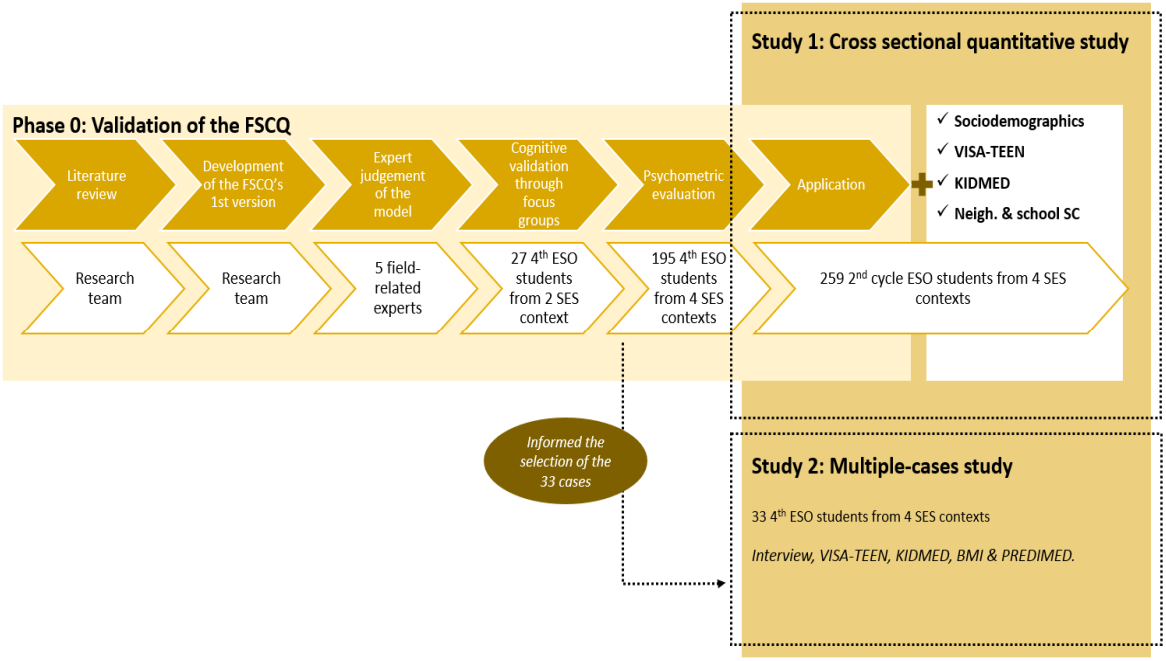

Figure 4: Study design. Source: Own elaboration.

Accordingly, the empirical work of this research is developed through these two concurrent studies, plus a previous phase in which a questionnaire to assess family social capital in adolescents is developed and validated to be applied in the subsequent and above mentioned concurrent studies. The development of this questionnaire responds to a gap identified during the literature review conducted to fulfil the first objective of this dissertation, which evidenced that while social capital had been quite extensively studied at the neighborhood, region, country or even workplace level in the last years, the family had been a neglected context in the social capital health related-research. Accordingly, a specific focus of this study is to deepen in the family environment as a source of social capital relevant to adolescent's health. Moreover, the development of validated measurement tools is one of the claims of the scientific community with regards to the study of social capital (Harpham et al., 2002; Van Deth, 2003; Villalonga-Olives & Kawachi, 2015).

Because one of the aims of this research is to take the effect of different socioeconomic contexts into account, we adopted a non-probabilistic purposive sampling. Accordingly, we chose to approach our sample through 4 different high-schools that responded to the following profiles (1) rural, (2) urban-high, (3) urban-medium, (4) urban-low.

The choice of *INS Pere Borrell* as the *rural* center of recruitment responds mainly to the representativeness of their student body. *INS Pere Borrell* is placed in Puigcerdà, and it is the only public high school in *La Cerdanya*, occupied by 18,063 inhabitants in this Pyrenees valley. The sole other option that secondary-school residents have is a state-subsidized private school that normally receives a third the volume of students that *INS Pere Borrell* does. As such, our choice gathers between 70-90 students per secondary education grade, coming from all over the region, where populations vary from less than 100 inhabitants in the case of Meranges to 8,761 in Puigcerdà[4]. Families also represent a wide range of SES levels, with a predominance of middle-class. La Cerdanya's gross disposable household income for 2010 was 16,100€ per inhabitant[5].

Jesuïtes Casp-Sagrat Cor de Jesús is the center through which we accessed the adolescents considered as pertaining to an *urban-high* context. Jesuïtes Casp receives students from different areas of the Metropolitan Area of Barcelona. Nevertheless, the gross disposable household income of the neighborhood where it is located (Dreta de l'Eixample), is 144% above

[4] IDESCAT, 2014.
[5] IDESCAT, 2010. Renda familiar disponible bruta. Comarques i municipis.

Barcelona's mean figure, which in 2010 was of 16,600€[6]. This center is a state-subsidized private school that accepts students from pre-school education to Baccalaureate. In the specific case of ESO they have around 120 students, divided into four classes.

INS La Llauna in Badalona served as a recruitment center for adolescents in the *urban-medium* group. It is placed in Badalona, the third most populated city in Catalonia, and part of the Metropolitan area of Barcelona. Badalona's gross disposable household income for 2010 was 16,200€ per inhabitant. INS La Llauna offers 3 lines of ESO per school year and two groups for Baccalaureate.

Adolescents in the *urban-low* group were reached through the public high-school *INS Eduard Fontserè,* located in the municipality of l'Hospitalet de Llobregat. L'Hospitalet de Llobregat is the second largest city in Catalonia, is included in the Metropolitan Area of Barcelona and has an important percentage of immigrant population. Its gross disposable household income for 2010 was 13,800€ per inhabitant.

Next, a detailed description of the methodology used for the empirical work is presented, so that the results can be evaluated and contrasted to comparable studies.

10.1. PHASE 0. Development and validation of the Family Social Capital Questionnaire (FSCQ)

This phase has consisted of five sub-phases: (1) literature review and identification of the most used constructs, dimensions and items to assess family social capital in the health related sciences; (2) development of the first draft of the questionnaire; (3) expert judgment of the model; (4) cognitive validation through focus groups; (5) psychometric validation, plus a sixth phase in which the validated questionnaire was applied to a broader sample together with health and lifestyle related items. This latter is part of the quantitative-cross sectional stage of this dissertation. In the next paragraphs the procedure and sample for each of the first five phases is detailed.

[6] Ajuntament de Barcelona. Distribució territorial de la Renda Familiar Disponible per Càpita 2012.

1. *Literature review and identification of the most used constructs, dimensions and items to assess family social capital in health sciences.*

The procedure and results of this phase are shown in section 8.4. Family social capital, the missing level in studies of social capital and health

2. *Development of the first draft of the questionnaire*

A first version of the FSCQ was drafted based on the work done in the previous step and the considerations of the leading team. With the aim of using the tool in the later phases of this research and of enhancing dissemination and the future use of the questionnaire by other researchers, a decision was made to develop the questionnaire in Spanish and to address it to 14-16 year-old teenagers.

3. *Expert judgment of the model*

Expert judgment is an investigative procedure commonly used to assess content validity, in order to evaluate the degree in which the instrument adequately reflects the construct that wants to be measured (Morales, 2000). In our case, four scholars with expertise in the field of social capital were contacted by e-mail and accepted to participate in the study. They were handed a portfolio that included (1) a description of the theoretical background upon which the questionnaire had been developed, in order to provide a reasoned framework to the approach used; (2) a first draft of the questionnaire; (3) presentation letters and informed consents to the participants to be evaluated; (4) a response grid, where the experts are asked to give their opinion with regard to adequacy, comprehensibility and clarity of the proposed categories, indicators and items. Their comments were used to modify the first draft of the FSCQ.

4. *Cognitive validation through focus groups*

The cognitive validation of the FSCQ was carried out through two focus groups with adolescents. This type of validation pursues to make sure that the questions and instructions are correctly understood by the participants, as well as to identify words and categories used by the target population and that can help to reformulate items (Morales, 2000). During this phase, the modified version with the judges' suggestions incorporated was discussed.

The two focus groups were held in February 2015, and participants were approached through a convenience sampling in two Catalan high schools. Given the fact that SES and living in a rural or urban area is likely to influence responses, two different and complementary settings were established to reach the sample: *INS Pere Borrell* (Puigcerdà) and *Jesuïtes Casp-Sagrat Cor de Jesús* (Barcelona).

In both schools, a first contact with the direction board was done through an email in which the study was introduced and the specific collaboration they were asked for was described. As can be seen in appendix A (in Catalan), they were invited to participate not only in this phase of the process, but also in the next steps of the validation process. As far as the focus groups were concerned, schools were requested to select 10-12 4th ESO students with different social and academic profiles in order to have a greater variety of inputs to our discussion. The students that were invited by the schools and whose parents signed the informed consent participated in the focus groups with a final sample of 12 students from *INS Pere Borrell* and 15 from *Jesuïtes Casp.* Both groups were balanced in terms of gender composition.

The focus group were carried out at the schools and took approximately 40 minutes to complete. At the beginning of the session, participants were given an explanation of the research and were encouraged to participate and give their opinion as much as possible. They were handed out a copy of the questionnaire and were asked to give a general opinion of the comprehension of the document, as well as formulate complex questions in their own terms. At every participant's intervention, consensus was sought from all the members of the group. The changes made at this point produced the final version of the questionnaire for the psychometric evaluation.

5. *Psychometric assessment*

With the aim of assessing the psychometric properties of the questionnaire, the last version was applied to a larger sample. All participants were recruited through a convenience sample of four secondary schools from different socioeconomic contexts (rural – *INS Pere Borrell*, Puigcerdà; high-income urban - *Jesuïtes Casp*, Barcelona; middle-income urban; *INS La Llauna*, Badalona; and low-income urban; *INS Eduard Fontserè*, L'Hospitalet). As in the previous phase, the Directory Board was contacted by email inviting the schools to participate by facilitating access to one or more groups of their 4th ESO students. High-schools were offered the possibility of their students receiving a conference about healthy eating, as a reward for their collaboration. A total of 195 students responded to the questionnaire during the two first weeks of March

2015. Questionnaires were facilitated by the researcher, who was present while the students filled it up and answered their questions when needed. Informal parental consent was obtained from all participants. Names on the informed consent and questionnaires were paired up and coded so that anonymity was ensured, while having the possibility of retrieving selected cases for the multiple-cases study conducted in study 1. Two of the questionnaires were discarded because they were incomplete. Table 4 summarizes the sample's most relevant characteristics, which were obtained through a set of 10 sociodemographic questions that accompanied the FSCQ. Of these, 59 adolescents participated in a test-retest assessment of the questionnaire, which were conducted three weeks apart.

Table 4

Sociodemographic data of the participant in the psychometric validation of the FSCQ.

		n (%)
Gender	Male	82(42.49)
	Female	111(57.51)
Context	Rural	63(32.64)
	Urban high SES	23(11.92)
	Urban medium SES	28(14.51)
	Urban low SES	79(40.93)
Adolescent origin	Autochthonous	155(80.31)
	immigrant	38(19.69)
Highest household educational level	No schooling or primary studies	11(06.22)
	Compulsory secondary school	27(13.99)
	Post-compulsory secondary school	34(17.62)
	Unfinished university	19(09.84)
	University studies	53(31.61)
	Missing	48(24.87)

Exploratory factor analysis (EFA) and Confirmatory Factor Analysis (CFA) are the statistical techniques most commonly used to assess construct validity. While EFA is used to explore the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome, CFA is used to verify the previously defined theory-driven factor structure of a set of observed variables (Child, 2006). CFA is a specific case of Structural Equation Modeling (SEM), which is described as "a technique to specify, estimate and evaluate models of linear relationships among a set of observed variables in terms of generally smaller number of unobserved variables" (Shah & Goldstein, 2006). The application of SEM entails the development of a *measurement model,* which tests the relationship of an unobserved variable (also referred to as a "latent variable" or "construct") with specific observed variables

(namely, “indicators”, or “measured variables”) and of a *path model,* which tests theoretical relationships between constructs.

A measurement model can be *reflective* or *formative* (Coltman, Devinney, Midgley, & Venaik, 2008). Reflective models assume that causality flows from the latent construct to the indicator. Thus, the latent construct is empirically defined in terms of the common variance among the indicators. However, this approach may not be appropriate for all constructs, as noted by Bollen and Lennox (Bollen & Lennox, 1991). According to them (and others - see MacKenzie & Podsakoff (2005) or Roy, Tarafdar, Ragu-Nathan, & Marsillac (2012)), in some cases the direction of causality can operate in the opposite direction, being the measures or indicators *composing* the latent construct – this is why they are also referred to as *composite models*. Figure 5 illustrates the causality flow of both models. The fact that the full meaning of the *composite latent construct* is derived from its measures has two important implications. On the one hand, there is the fact that formative models do not require the measures to be correlated (and therefore internal consistency reliability, as assessed by Cronbach’s alpha would not be an appropriate standard for evaluating these models). On the other hand, the potentially negative consequences of dropping a reflective indicator, as part of the meaning of the latent construct would be lost. The wrong consideration of reflective (or formative) measures as formative (or reflective) measures is known as *misspecification*, and can lead to both type I and type II errors (Coltman et al., 2008; MacKenzie & Podsakoff, 2005; Shah & Goldstein, 2006).

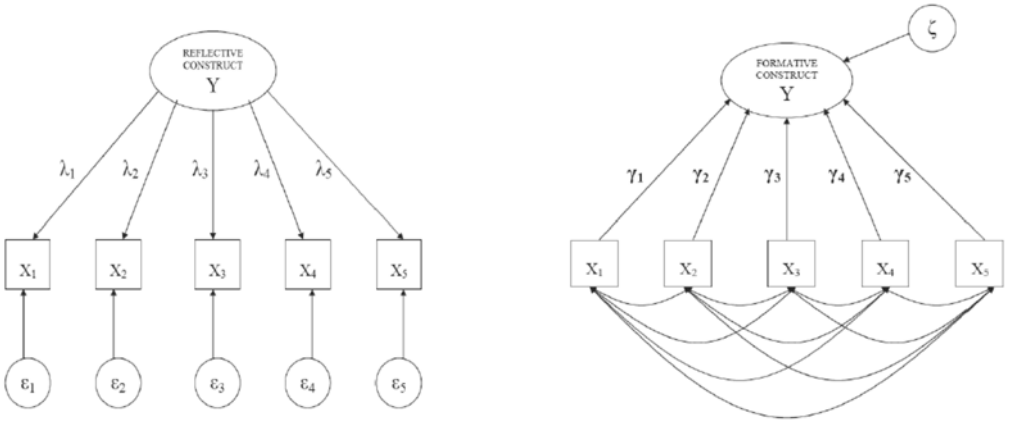

Figure 5. Structure of reflective and formative constructs

An example of reflective constructs are psychological tests in which an increase in the severity of a trait, behavior or disease is reflected by an increase in (roughly) all indicators. On the contrary, a typically cited example of formative construct is SES. SES is *informed* by one person's education, occupational prestige or income and its value would increase only with the increase of one of the indicators, even if the others remain the same (Bollen & Lennox, 1991). However, scales often include both, formative and reflective indicators (Christophersen & Konradt, 2012). Our questionnaire constitutes one of these, and includes both formative and reflective measures. For example, items measuring *collective efficacy* have a reflective character, because higher collective efficacy is expected to be translated in higher scores in both indicators (i.e. "we work well as a family", "in case of difficulties, we act collectively and cooperate to solve it"). On the contrary, to have a high mark on the bridging social capital dimension, one does not necessarily require the presence of people of different nationalities, plus individuals with different educational levels, plus family members with higher income, etc. in his or her family.

Being aware of these differences, and considering the theoretical approaches to construct validation in scales containing a mixture of reflective and formative indicators done by the authors mentioned in the previous paragraphs, the following tests were conducted to assess the psychometric properties of the FSCQ:

1) Intra-class correlation coefficient analyses (ICC, a two-way random effects single measure) was used to assess the test-retest reliability. The ICC was classified as follows: excellent (≥0.81), good (0.61-0.80), moderate (0.41-0.60), poor (≤0.40) (MacKenzie & Podsakoff, 2005; Morales, 2000).
2) Cronbach's alpha was used to assess the internal validity of the factors. Cronbach's alpha was classified as >0.70="adequate" and >0.80= "optimal" (Morales, 2000).
3) Confirmatory factor analysis (CFA) was used to test whether the data would fit the hypothesized measurement model based on theory and previous research. Optimal CFA model fits were Root Mean Square Error of Approximation (RMSEA) <0.06-0.08 and Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) ≥0.95 (Schreiber, Nora, Stage, Barlow, & King, 2006).

The assessment of both convergent and discriminant validity are standard procedures in the development and validation of psychosocial scales. Convergent validity refers to the degree to which two measures of constructs that theoretically should be related, are related. In contrast,

discriminant validity tests whether concepts or measurements that are supposed to be unrelated are, actually, unrelated. In our case, because no *gold standard* exists to test convergent validity nor is there enough theoretical and empirical development of family social capital as a construct to test discriminant validity, these two steps were not applied.

The descriptive and reliability analyses were performed using IBM-SPSS.19. For the CFA, M-Plus 7.2 was used.

10.2. STUDY 1. Cross-sectional quantitative study

This phase corresponds to a cross-sectional study in which a questionnaire containing sociodemographic, social capital and health-related questions was applied to a broad sample of adolescents from the Metropolitan Area of Barcelona and La Cerdanya, through which we sought to study the possible correlations between sociodemographic and social capital variables and lifestyle, eating habits and weight status-related elements of the sample.

Sample

Participants were recruited through a convenience sampling made by contacting the same four schools that participated in the previous phase. In this case, we requested access to 2nd cycle students that had not previously responded to the FSCQ, which in practical terms meant 3rd grade students or 4th grade students in sections that had not previously participated in the study. In total, 258 adolescents participated in this phase of the research. As in the other stages, parental informed consent was required to participate. No exclusion criteria were defined.

Table 5 shows the sociodemographic composition of the sample.

Table 5

Sociodemographic composition of study 1's sample.

		n (%)
Gender	Male	126 (48,8)
	Female	132 (51,2)
Context	Rural	97 (37,6)
	Urban high SES	52 (20,2)
	Urban medium SES	71 (27,5)
	Urban low SES	38 (14,7)
Adolescent origin	Autochthonous	74 (28,7)
	immigrant	184 (71,3)
Parental origin	Both parents autochthonous	88 (34,1)
	At least one parent immigrant	170 (65,9)
Highest household educational level	No schooling	3 (1,2)
	Primary studies	39 (15,1)
	Compulsory secondary school	13 (5)
	Post-compulsory secondary school	31 (12)
	Unfinished university	24 (9,3)
	University studies	140 (54,26)
	Missing	8 (3,1)
Weight status	Underweight	11 (4,3)
	Normoweight	183 (70,9)
	Overweight	37 (14,3)
	Obesity	4 (1,6)

Instruments

Data was collected through the following sources of information, which were combined into a single file that was handed to the participants:

1. A SOCIODEMOGRAPHIC data questionnaire – which gathered information about age, gender, place of birth, parental place of birth, residence location, parental education.
2. The VISA-TEEN questionnaire (Costa-Tutusaus, 2014) was used to evaluate adolescents' overall lifestyle, as well as its sub-dimensions, namely, nutrition [compliance with the ASPCAT 2012 food pyramid, plus water and other fluids' intake], physical activity [weekly moderate and high intensity practice], rational use of technologic leisure [hours dedicated to social networks and electronic games], toxic habits [tobacco, alcohol and other drugs' consumption] and hygiene [sleep hours, hands and teeth washing]. The total mark is 45, and each dimension's score ranges from 0-3. Additionally, the questionnaire includes 4 sociodemographic questions [birth date, gender, nationality, parental country of birth], weight and

height register and the single-item Self-Rated Health (SRH) index, and the 4 indicators of the FAS-II. In our case, weight and height were measured by the researcher, as follows:

3. The KIDMED Questionnaire (Serra-Majem et al., 2004) was used to assess the adolescents' adherence to the Mediterranean diet. This index has been developed in the frame of the enKid Study (2000-2003), and it has been used in a wide spectrum of studies. The index ranged from 0 to 12, and final score is classified into three levels (1) >8, optimal Mediterranean diet; (2) 4-7, improvement needed to adjust intake to Mediterranean patterns; (3) ≤ 3, very low diet quality. Higher scores in this sixteen yes/no-items questionnaire suggest not only a better compliance with the Mediterranean diet pattern, but also a greater nutritional adequacy, especially with regard to vitamins and minerals.
4. The FAMILY SOCIAL CAPITAL QUESTIONNAIRE in its definitive version, to which, in order to assess social capital in other domains than family, we added a six-item scale that had been previously used in other studies investigating the influence of social capital in health-related outcomes in adolescents (Novak & Kawachi, 2015; Novak, Suzuki, & Kawachi, 2015). Family support was assessed by the single item: '*Do you feel your family understands and gives attention to you?*'. Neighbourhood social capital was assessed by two items: '*Do you feel people trust each other in your neighbourhood* (neighbourhood trust)?' *'Do you feel that your neighbours step in to criticize deviant behaviour among high school students* (informal social control)?'. School social capital was assessed by three questions; '*Do you feel teachers and students trust each other in your high school* (teacher-student interpersonal trust)?' '*Do you feel students trust each other in your high school* (student interpersonal trust)?' '*Do you feel students collaborate with each another in your high school* (students' collaboration in school)?' The response options to all questions were on a Likert scale: 'strongly agree'; 'agree'; 'neither agree or disagree'; 'disagree'; 'strongly disagree'. The 'disagree' and 'strongly disagree' responses were combined to create a dichotomous variable indicating lower perceived social capital. Cronbach's alpha of the 3-item school social capital subscale was 0.71, and for the 6-item social capital scale 0.73.

The final file, with a presentation letter to the participants (in Spanish) can be found in appendix B. No coding of the respondents was made, as confidentiality had been guaranteed and there was no need to track respondents.

The operationalization of the variables is shown in Table 6.

Procedure

As described above, the questionnaire was distributed to four high-schools from different socioeconomic contexts: (1) rural – INS Pere Borrell, Puigcerdà; (2) high-income urban - Jesuïtes Casp, Barcelona; (3) middle-income urban; INS La Llauna, Badalona; and (4) low-income urban; INS Eduard Fontserè, L'Hospitalet. These schools had been first contacted during the FSCQ validation phase and had been invited to collaborate in the subsequent stages of the research. In this specific case, questionnaires were brought to the schools with specific instructions on the purpose and orientation of the study and coordinators were given responses to possible questions, as they were in charge of its application. An informative letter to the parents along with the informed consent was also included in the package.

Once the questionnaires were filled out, the responses were transcribed into IBM SPSS v19.

Table 6

Dimensions and variables used in study 1, and their operationalization

Dimension/ Instrument	**Variable**	**Description**
Socio-demographic characteristics	Gender	Male/Female
	SESContext	1. Rural; 2. Urban high SES; 3. Urban medium SES; 4. Urban low SES
	AMBIT_RurUrb	Rural or urban context
	AdolAutoc	Adolescent origin (autochthonous/immigrant)
	MotherAutoc	Mother origin (autochthonous/immigrant)
	FatherAutoc	Father origin (autochthonous/immigrant)
	ParentsAutoc	Parental origin (both autochthonous/at least one immigrant)
	Years_city	Years of residence in the municipality
	EducMother	Highest educational level achieved by the mother
	EducFather	Highest educational level achieved by the father
	HighEducHousehold	Highest educational level achieved by the parents
BMI	zBMIhi	zBMI
	BMICateg	BMI categorized (-1. underw; 0. normow; 1. overw; 2. obesity)
	BMIDichot	BMI dichotomized (0.underweight or normoweight; 1 overweight or obesity).
VISA-TEEN questionnaire	VT_TOTAL	Total lifestyle (max. 45)
	VT_Nutrition	Nutrition (0-3)
	VT_ PhysAct	Physical Activity (0-3)
	VT_RUTL	Rational Use of Technological Leisure (0-3)
	VT_ToxicHab	Toxic Habits (0-3)
	VT_Hygiene	Hygiene (0-3)
	SRH	Self-rated health (1. Excellent; 2. Very good; 3. Good; 4. Moderate; 5. Bad)
KIDMED questionnaire	K_Fruit1	KIDMED 1_Eats 1 piece of fruit daily (yes/no)
	K_Fruit2	KIDMED 2_Eats 2 pieces of fruit daily (yes/no)
	K_Vegetabl1	KIDMED 3_Eats 1 portions of vegetables daily (yes/no)
	K_Vegetabl2	KIDMED 4_Eats 2 portions of vegetables daily (yes/no)
	K_Fish	KIDMED 5_Eats 2-3 portion of fish weekly (yes/no)
	K_FastFood	KIDMED 6_Eats fast food at least once a week (yes/no)
	K_Pulses	KIDMED 7_Eats pulses twice a week (yes/no)
	K_PastaRice	KIDMED 8_Eats pasta/rice at least 5 times per week (yes/no)
	K_BreakfCereal	KIDMED 9_Eats cereals for breakfast (yes/no)
	K_Nuts	KIDMED 10_Eats nuts two or three times per week (yes/no)
	K_OliveOil	KIDMED 11_Consumes olive oil habitually (yes/no)
	K_NoBreakfast	KIDMED 12_Does not have breakfast (yes/no)
	K_BreakfDairy	KIDMED 13_Eats a dairy product for breakfast (yes/no)
	K_BreakPastry	KIDMED 14_Eats pastry for breakfast (yes/no)
	K_YogCheese	KIDMED 15_Has two daily portions of yogurt/cheese (yes/no)
	K_Candies	KIDMED 16_Eats candy daily (yes/no)
	KIDMED_Total	KIDMED_Total mark (0-14)
	KIDMEDCat	KIDMED_Categorized (1. low quality; 2. can be improved; 3. adequate)

FSCQ	FSCQ_NormsBed	Norms bedtime (yes, no)
	FSCQ_NormsScreen	Norms screen time (yes, no)
	FSCQ_NormsCurfew	Norms curfew (yes, no)
	FSCQ_NormsAlcohol	Norms alcohol (yes, no)
	FSCQ_NormsTobacco	Norms tobacco (yes, no)
	FSCQ_NormsFood	Norms food (yes, no)
	FSCQ_NormsChores	Norms chores (yes no)
	FSCQ_SocInt_HH	Social Interaction household (continuous)
	FSCQ_SocInt_OH	Social Interaction out household (continuous)
	FSCQ_ColEff_HH	Collective Efficacy household (continuous)
	FSCQ_ColEff_OH	Collective Efficacy out household (continuous)
	FSCQ_InfContr_HH	Informal Control household (continuous)
	FSCQ_InfContr_OH	Informal Control out household (continuous)
	FSCQ_Belong_HH	Sense of belonging household (continuous)
	FSCQ_Belong_OH	Sense of belonging out household (continuous)
	FSCQ_NegSS_HH	Negative Social Support household (continuous)
	FSCQ_NegSS_OH	Negative Social Support out household (continuous)
	FSCQ_SocIntTOTAL	Total Social Interaction (continuous)
	FSCQ_NormsTOTAL	Total Social Norms (continuous)
	FSCQ_ColEffTOTAL	Total Collective Efficacy (continuous)
	FSCQ_InfContrTOTAL	Total Informal Control (continuous)
	FSCQ_BelongTOTAL	Total Sense of belonging (continuous)
	FSCQ_NegSSTOTAL	Total Negative Social Support (continuous)
	FSCQ_STRUCTURAL	Structural SC (continuous)
	FSCQ_COGNITIVE	Cognitive SC (continuous)
	FSCQ_BRIDG_OH	Bridging + out household (continuous)
	FSCQ_FSC_HH	SC household (continuous)
	FSCQ_FSC_OH	SC out household (continuous)
	FSCQ_TOTAL	FSC_TOTAL (continuous)
Other domains' SC items	SCFam	SC Family (low, high)
	SCNeigh	SC Neighborhood (low, high)
	SCSchool	SC School (low, high)
	SCTOTAL	SC All Sources (low, high)

Data analysis

This phase of the empirical work aimed to contribute to the achievement of objective 3. In order to study the association of social capital and the selected health outcomes while taken due account of the influence of the sociodemographic characteristics, regression modelling was selected as the most suitable analysis strategy. Logistic regression were chosen over linear models was because of the nature of our dependent variables, which after defining atypical and extreme cases as *missing,* and even after trying arithmetical transformation of the variables themselves, a normal distribution was not found, with the exception of BMI.

Additionally, logistic regressions, by design, overcome many of the restrictive assumptions of linear regressions. As in the case of normality, linearity and equal variances are not assumed, nor is it assumed that the error term variance is normally distributed. The major assumption is that the outcome must be discrete, otherwise explained as, the dependent variable should be dichotomous in nature. Also, there should be a linear relationship between the odd ratio and the independent variable. Linearity with an ordinal or interval independent variable and the odd ratio can be checked by creating a new variable that divides the existing independent variable into categories of equal intervals and running the same regression on these newly categorized versions as categorical variables. Linearity is demonstrated if the b coefficients should increase or decrease in linear steps.

Logistic regressions are regression models where the dependent variable is categorical and they allow two prospects: (1) to predict a response (dependent variable value) based on one or more predictive (independent) variables; (2) to quantify the relative importance of the relationship between each of the predictive variables and the dependent variable (Efroymson, 1960). In our case, we pursued the explicative function, in other words, we aimed to ascertain whether each variable in the analysis made a significant contribution to explaining the variation in the health measure, having held constant all the other variables.

The Nagelkerke R^2 and Cox & Snell R^2 will assess the variability accounted for on the dependent variable by the independent predictor variables. The overall model significance for the logistic regression will be examined by the collective effect of the independent variable, presented with a $\chi 2$ coefficient. Individual predictors will be assessed by the Wald coefficient. Predicted probabilities of an event occurring will be determined by Exp (B). For significant predictors, a value greater than one indicates that with a one unit increase in the independent variable, the dependent variable will be X times more likely to be coded 1. Significant predictors with an Exp (B) less than a value of 1, will be evaluated by 1/Exp (B), suggesting that a one unit increase in the independent variable will be X times more likely to be coded 0.

There are different methods of including variables in the logistic regression model (Menard, 2002). As a first option, we used forward stepwise selection. Forward stepwise selection methods depart from a model 0 which contains only the constant, and then, in every step, the independent variable most likely to influence the model is added. This procedure is repeated until none improves the model. Variables are examined and the coefficients which make the

observed results “more likely” are selected while the others are removed using either the Wald statistic or the Likelhood-Ratio test. In our case, Wald statistics were applied.

When forward stepwise regression did not produce satisfactory results (for example, in those cases in which only one variable was included in the model and with low R^2), the *enter* method, which allows to add variables manually, was used instead.

Absence of multicollinearity is requested to do a correct estimation of the contribution of each predictor variable (DeMaris, 1995). Because one of the purposes of our study is to elucidate whether the different dimensions of social capital in different domains exerts a different effect on our selected health outcomes, we included subscales of the FSCQ, as well as subscales of the *lifestyle* and KIDMED questionnaires that are necessarily correlated with the overall score. In order to overcome this limitation and to identify other possible highly correlated variables, we ran a Principal Component Analysis (PCA). The objective of this operation was to group under the same factor the independent variables that were correlated, thus, avoiding multicollinearity problems. By applying this technique, variables within the same factor should be correlated among them, whereas factors should not be correlated.

A commonly used method to test errors and assess the accuracy of the models consists of testing the model against a new set of data that was not used to create the model (Harrell, 2001). In our case, we did this by building the model with 60% of the sample, and then using the remaining 40% to assess the accuracy of the model. Finally, the model was tested again using the whole data set.

Using odds ratio to present the results is recommended when the study is interested in the impact of the independent variables, controlling for the effect of the others, as well as to prevent the full effect of the true impact of a unit change in independent variables on the outcome variable (DeMaris, 1995; Morgan & Teachman, 1988). The purpose of this study is to discover the significance of the predictor variables in contributing to the dependent variables (TOTAL_EdV, SRH, KIDMED and BMI), controlling for the other analysis variables.

Accordingly, we conducted descriptive and preliminary correlational analyses. The first steps of this process included the verification of the normal distribution for the dependent variables using the Kolmogorov-Smirnov test (only BMI shows a normal distribution after removing atypical an extreme cases, $p>.200$); definition as a *missing* extreme and atypical cases, attempt

to apply arithmetic (x^2, x^3, x^{10}) transformations to achieve normality (without success), verification of variance homogeneity and dichotomization of the dependent variables KIDMED (0 = 1st and 2nd quartiles; 1= 3rd quartile), Total_VT (0 = 1st and 2nd quartiles; 1= 3rd quartile), SRH (0, poor = answers 4,5; 1, good = answers 1,2,3) and BMI (0 = normoweight and underweight; 1 = overweight and obesity).

We also compared the means of the dependent variables and their subscales, as well as social capital results for the four SES context groups. One-way ANOVA was conducted when homogeneity of variances was met according to Levene statistic. For significant ANOVAs, we next conducted a post hoc comparison using Turkey's HSD test to identify which specific groups differed among them. In the cases in which homogeneity was not fulfilled (Levene statistic sig.<.05), we ran a Welch F test and used Games-Howell for the post hoc tests, when Welch F test was significant.

After that, we conducted a correlational analysis between the dependent variables and the variables considered as potential effect variables. We used Pearson Correlation for normal variables and Spearman Rank Correlation for non-normal variables, which is an appropriate test when one or both variables are ordinal and/or normality and homoscedasticity assumptions are not met.

10.3. STUDY 2. Multiple Cases' Study

This phase was developed through case studies in which the role of social capital in relation to lifestyle, eating habits and weight status in adolescents is studied in depth. According to our aim of understanding the influence of social capital on adolescents' health behaviors as a social phenomenon, we followed a qualitative description (QD) approach, as described by Sandelowski (2010). According to Neergaard and colleagues, QD "should be the method of choice only when a description of a phenomenon is desired" (Neergaard, Olesen, Andersen, & Sondergaard, 2009:3) In contrast to phenomenology, grounded theory or ethnography, all of which follow specific methodological viewpoints, QD is more objective-driven, and its main focus is to comprehend a certain event or reality.

Sample

Consistent with qualitative description, a purposeful and maximum variation sampling strategy was employed. Accordingly, *generic* [research interest was not to investigate the particular characteristics of cases], *typical cases stratified by criteria* [cases were chosen based on certain characteristics shared among the members of the group of interest], were selected with the intention of gaining insight into the role of social capital and significant lifestyle and diet-related variables in adolescents from different socioeconomic contexts from the perspective of each case (Coller, 2000; M. Patton, 2002; Pope & Mays, 2006; Sandelowski, 2000). Data inference of the studied cases does not pursue generalization, rather, we look for an analytic inquiry that can serve as a bases for future quantitative research.

The sample frame for selecting cases consisted of participants in the FSCQ validation phase. During the application of the questionnaire, participants and their parents were asked to indicate whether they would like to be contacted in future phases of the research, if their profile matched the inclusion criteria. Thus, from the 195 respondents of the FSCQ, all of them students of 4t grade ESO at INS Pere Borrell, Jesuïtes-Casp, INS La Llauna or INS Eduard Fontserè, 40 cases were selected according to the following conditions:

- Rural vs urban area of residency.
- SES family level, measured by parental education, according to the classifications from the Spanish Society of Epidemiology (Sociedad Española de Epidemiología, 1995). In agreement, we set to select half of the cases whose highest parental education was up to post-compulsory secondary education, and the other half with an educational level higher than that.
- Body Mass Index, based on the WHO definition and z-scores. A total of forty cases were selected, twenty of which had a BMI +1SD higher than the mean for the same age and gender teenagers (indicator of overweight or obesity); and the other twenty had a BMI between –2DE and +1DE distance of the mean (indicator of normoweight).
- Family structure, in order to capture particularities in the effect that different family types can have on eating habits or lifestyle, we selected cases with the following family structures: (1) single-parent family, (2) two adults and only child, (3) two adults and two children, (4) large family, (5) extended family at the household.
- Equity of gender will be kept as much as possible.

- Adolescents with a particular condition that can influence the objective of this study, such as the practice of an elite sport or the existence of diet-related diseases (i.e. Intolerances, allergies, diabetes or eating diseases), were deliberately excluded. These conditions were mentioned to the contact person in each school so that they could provide us with this information.

Table 7 shows cases distribution according to the selection criteria. After reviewing the sociodemographic characteristics of our sample frame, two profiles were not found, and for seven others, the selected participants rejected the invitation to participate. For two of them, a substitute was found, while there were no additional participants that responded to the desired profiles for the other five. Thus, the final sample for the case studies was of 33 participants.

Table 7

Sociodemographic characteristics of the cases studied in study 2

Group	ID	Gender	Territory	SES	BMI	Family structure at the household
1	P013	M	Rural	High	N	Only child
1	P017	M	Rural	High	N	Two adults + two children
1	P025	F	Rural	High	N	Large family
1	P215	F	Rural	High	N	Single parent/Two households
2	P010	F	Rural	High	O+	Single parent/Two households
2	P055	F	Rural	High	O	Large family
2	P209	M	Rural	High	O	Extended family
2	P245	F	Rural	High	O	Two adults + two children
3	P027	F	Rural	Low	N	Only child
3	P216	F	Rural	Low	N	Extended family
3	P236	M	Rural	Low	N	Large family
3	P239	M	Rural	Low	N	Large family
3	P241	M	Rural	Low	N	Two adults + two children
3	P253	F	Rural	Low	N	Single parent/Two households
4	P002	F	Rural	High	O	Two adults + two children
4	P006	M	Rural	Low	O+	Only child
4	P007	F	Rural	Low	O+	Single parent/Two households
4	P200	M	Rural	Low	O	Two adults + two children
4	P254	F	Rural	Low	O	Extended family
5	B002	M	Urban	High	N	Two adults + two children
5	B016	F	Urban	High	N	Extended family
5	C010	M	Urban	High	N	Large family
5	C013	F	Urban	High	N	Only child
5	C022	M	Urban	High	N	Single parent/Two households
5	C030	F	Urban	High	N	Large family
6	B004	M	Urban	High	O	Single parent/Two households
6	C012	M	Urban	High	O	Only child
7	B018	F	Urban	Low	N	Single parent/Two households
7	L'H008	F	Urban	Low	N	Extended family
7	L'H028	F	Urban	Low	N	Two adults + two children
8	B014	F	Urban	Low	O	Only child
8	B059	M	Urban	Low	O	Single parent/Two households
8	L'H023	F	Urban	Low	O	Only child

Note: *Low: Highest educational parental level up to post-compulsory secondary school; High: Highest educational parental level beyond post-compulsory secondary school; M: Male; F: Female; N: Normoweight; O: Overweight; O+; Obesity*

Data Collection

This phase was conducted through in-depth interviews that were held at the schools of the participants. Participants were anticipated that interviews would last between 60-90 minutes, which included an introduction to the research, the administration of the consent form –

students brought signed parental consent with them-, weight and height measurement, open ended questions and the application of the following instruments:

1. The *KIDMED Questionnaire* (Serra-Majem et al., 2004).
2. The *VISA-TEEN questionnaire* (Costa-Tutusaus, 2014).
3. ANTROPOMETRIC MEASURES: *Height* was measured in millimetric position using a portable stadiometer (Seca 217®, Hamburg, Germany), with the subjects head in Frankfurt position and millimetric precision. *Weight* was determined to the nearest 0.1 kg using a digital scale (Seca 874®, Hamburg, Germany). Participants were barefoot, and wearing light clothes. Weight and Height measures were used to calculate BMI (kg/m^2). With the aim to facilitate comparability, subjects were classified according to the WHO reference charts and z-scores cut-points (WHO, 2007a).
4. *PREDIMED Questionnaire* (Martínez-González et al., 2012), which students took home to be filled out by their mothers with the intention of assessing the potential effect of maternal adherence to the Mediterranean Diet. They returned the questionnaire sending, by email, a picture of the completed form to the researcher. This questionnaire consists of yes/no 14 items which yield a total score between 0 and 14. Responses were classified into two categories: low adherence (≤7) vs high adherence (>7).
5. SEMI-STRUCTURED INTERVIEW exploring the adolescent's social environment as well as their views on lifestyle and diet-related issues. The general script for the interviews is shown in Figure 6. Text in bold indicates the opening text for each question. Then the script was adapted, when necessary, to the situation and discursive development of the conversation with the participants.

Participants were first invited to respond to the questionnaires. The average time of response was 30-40 minutes for all of them. Once filled out, the researcher went over the questionnaires to identify relevant points to discuss during the subsequent interview, which was recorded. Weight and height measures were taken at the end of the session, to avoid interferences in the participants' discourse.

1. **How would you describe the place you live in? Do you like it? Why?**
   Do people in _____ know each other? Do people trust each other? Do neighbors get along?
   Are there good places to spend time in _____?
2. **How would you describe your family? How do you feel about them? What kind of things do you do with them?**
   Do you feel you can make you own decision as much as you want?
3. **How would you describe your group(s) or friends? How do you feel about them? What kind of things do you do with them?**
4. **How would you describe your school? Do you like it? How is the relation between students? And with the teachers?**
   Do you have opportunities to participate, in school?
5. **Apart from the people we just mentioned, is there anyone else that is important to you and we have not talked about?**
6. **How would you describe your lifestyle?**
7. **How is your diet?**
8. **How would you define eating well? Do you eat well?**
9. **Why do you eat like you eat? How have you learned it?**
10. **What things help you to eat well? What things make it more difficult?**
11. **In general, what reasons do people of your age have to eat how they eat?**
    What are the main reasons why you chose to eat what you eat?
12. **How would you say that the different groups that we have talked about influence you lifestyle? And your diet?**
    Do you eat the same way whether you are with them or not?
13. **Have you ever tried to change your diet? Where did you find support (or who would you turn to if you wanted to change it?**
14. **Is there any other aspect with regard to your diet that you think it is relevant and we have not talked about?**

Figure 6. Script for the semi-structured interview in the multiple cases' study.

Data Analysis

Interviews were recorded and transcribed into NVivo10 qualitative data analysis software (QSR International Pty Ltd. Version 10, 2012). The results of the questionnaires were first transcribed into IBM-SPSS 22, and then imported to NVivo10 to be able to analyze data all together. Transcriptions were first read thoroughly to acquire a general sense of the information contained. Next, data was coded into three main domains: social capital variables, lifestyle features and dietary habits. Social capital categories were mainly drawn from the work done in the previous review of the literature described on the theoretical background of this dissertation and, at a conceptual level, was based on the work of Harpham (2002); Kawachi & Berkman (2014); Kawachi, Subramanian, & Kim (2008); Morgan & Haglund (2009); Morgan & Swann (2004) and Morrow (1999). The whole *tree node* of categories can be seen in Figure 7. Interview fragments were classified into more than one category or subcategory, if applicable.

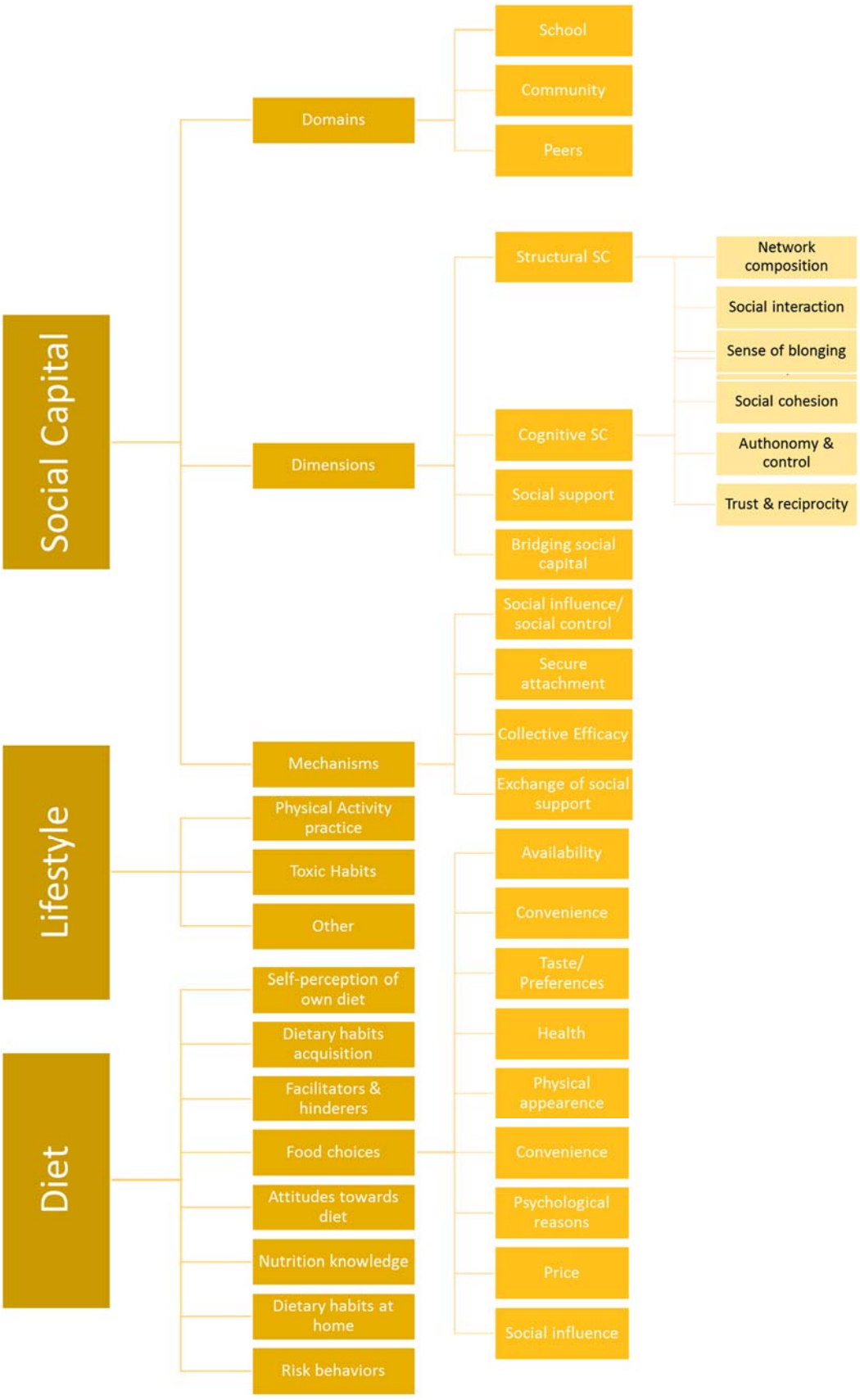

Figure 7. Categories of content analysis for the multiple cases' study.

QD has often been judged as lacking rigor and credibility. Milne and Oberlee (2005) propose several strategies and techniques to enhance rigor, which are aligned with Guba and Lincoln's argument that qualitative research credibility should be assessed through different criteria than the ones used in more positivistic approaches (Lincoln & Guba, 1985). These strategies are addressed to enhance trustworthiness through ensuring *authenticity, credibility, criticality* and *integrity. Authenticity* is guaranteed by using purposeful and flexible sampling methods and using participant-driven data collection in which richness rather than superficiality of data is promoted. It also involves an accurate transcription and data-driven coding and categorizing in order to make sure that informant's perceptions are accurately represented. *Credibility* reflect the degree in which results are believable and requires capturing and portraying a truly insider perspective. *Criticality* refers to the critical reflection on all decisions made throughout the process, and it is ensured by reflecting on the critical appraisal applied to every research decision. *Integrity* has been described by the most important criteria to meet in QD, and it has to do with the researcher being aware of its emic position, and accordingly establishing procedures to minimize the subjective element in the process and creating transparent and honest narrations.

The procedures that have been used in this dissertation to enhance trustworthiness include purposeful and flexible sampling in order to select relevant cases and to compare adolescents' social capital and lifestyles depending on their socioeconomic context. The same researcher conducted, transcribed verbatim and coded all the interviews, with the intention of guarantee an accurate transcription, which also allowed to recall aspects of the interviews that might have otherwise been omitted. Content analysis using themes as a unit of analyses was conducted. Theme's presence – and not magnitude- was the criteria of exploration, so as to avoid overweighting vivid events, underweighting data that do not agree with the researcher's expectations or cleaning up humans' inherent contradictions. Large units of analysis were used, in order to guaranteeing that themes were accurately interpreted in the context of the conversation.

Criticality and integrity, as the key points to be ensured in QD, were enhanced through debriefing sessions with external auditors such as the thesis supervisor and members of the research group with expertise either in the methods used or the content of this dissertation (Green & Thorogood, 2009; Neergaard et al., 2009; Sandelowski, 2010).

Results of the empirical work

11. Development and validation of the Family Social Capital Questionnaire

The process of development of the Family Social Capital Questionnaire (FSCQ) consisted of five sub-phases (1) literature review and identification of the most used constructs, dimensions and items to assess family social capital in the health related sciences; (2) development of the first draft of the questionnaire; (3) expert judgment of the model; (4) cognitive validation through focus groups; (5) psychometric validation. In the following pages we summarize the results of sub phases two to five (results for the first one are already exposed in the theoretical background).

11.1. Development of the first draft of the questionnaire

The literature review on family social capital in the family environment served as a bases for the development of the FSCQ. We departed from the constructs, subscales and items summarized in table 3 to draft the first version of the questionnaire. This version had a total of 42 items grouped into 13 questions. Nine of these questions used nominal or likert scales, while the other two were open-ended queries in which participants were asked to write down the kinship with the different members of their family.

Table 8 shows the different dimensions, categories, indicators and its correspondence with the different items of the FSCQ. Also, the first draft of the FSCQ can be seen in the pages below.

Table 8

Dimensions, categories, indicators and items used in the elaboration of the FSCQ

Dimension	Category	Indicator	Item	Adapted from:
Structural SC	Structure of the network	- Number of family members in the household. - Number of family members outside the household	1; 3	*Litwin, H. & Stoeckel, K.J., 2014; Litwin H, 2011; Litwin H, Shiovitz-Ezra S., 2011; Bala-Brusilow, C., 2010; Keating N, Dosman D., 2009; Ferlander S, Mäkinen IH., 2009;* *Helliwell JF, Putnam RD., 2004;* *Runyan DK et al. 1998;* *Furstemberg & Hughes, 1995;* *Widmer ED, Kempf N, Sapin M, Galli-Carminati G., 2013;* *Bassani, C., 2008; Gonsalves, L., 2007*
Structural SC	Quality of the ties	-Relationship (father, step-mother, brother, uncle…) with the members of the family.	2; 4	*Litwin, H. & Stoeckel, K.J., 2014;* *Litwin H, 2011; Litwin H, Shiovitz-Ezra S., 2011; Bala-Brusilow, C., 2010;* *Keating N, Dosman D., 2009; Ferlander S, Mäkinen IH., 2009; Bassani, C. 2008.* *Kirst, M., 2007; Helliwell JF, Putnam RD., 2004; Runyan DK et al. 1998; Furstemberg & Hughes, 1995; Widmer ED, Kempf N, Sapin M, Galli-Carminati G., 2013.*
Structural SC	Social Interaction	Frequency of doing the following activities with the household and outside the household family members: a. Playing indoor games b. Going for a walk c. Do the shopping d. Going to the movies, to a concert, to a picnic. e. Sitting and talking f. Having dinner together g. Talking on the phone h. Visiting relatives i. Going to church together j. Going to watch sports events k. Watching TV shows together l. Preparing meals together m. Do homework together (eg parents helping children, siblings helping each other)	7; 8	*Morgan AR, Rivera F, Moreno C, Haglund BJ., 2012.; Morgan A, Haglund BJ., 2009;* *Furstemberg & Hughes, 1995;* *Rothon C, Goodwin L, Stansfeld S., 2012;* *Wu Q, Xie B, Chou CP, Palmer PH, Gallaher PE, Johnson CA., 2010; Li S, Delva J., 201;* *Ferlander S, Mäkinen IH., 2009.* *Furstemberg & Hughes, 1995.* *Dufur, M., Parcel, T. & McKune, B. 2013* *Han, Y., 2012; Lau, M. & Li, W., 2011* *Bala-Brusilow, C., 2010;* *Farrel, C., 2010;* *Berntsson, L., Köhler, L. & Vuille, J.C., 2007* *Gonsalves, L., 2007; Jokinen-Gordon, H., 2007*

Cognitive SC	Collective efficacy	Perception of working well as a family	9.1; 10.1	*Li S, Delva J., 2010.*
Cognitive SC	Informal Control	Perception of importance of following family's rules.	9.2; 10.2	*(Adapted from the FACES IV Questionnaire).*
Cognitive SC	Sense of belonging	Closeness	3; 5	*Li & Delva, 2012, 2010* *Litwin, 2011.*
		Reliability on family members for support and help with serious problems	9.3; 10.3	
Cognitive SC	Negative social support	Excess of demands Personal goals conflicting those of the family Frequency of arguing Critiques between family members	11; 12	*Li & Delva, 2012, 2010; Litwin, 2011.* *Rothon et al., 2012.*
Horizontal SC	Bridging SC	Number of connections with family members outside the household whom: - Have different ways of spending leisure time, compared with family members in your household. - Have different nationalities, compared with family members in your household. - Have a lower educational background, compared with family members in your household. - Have a higher educational background, compared with family members in your household. - Have different sexual orientations, compared with family members in your household. - Have more economic resources, compared with family members in your household. - Have less economic resources, compared with family members in your household. - Have works related to: Give examples of occupation for the different social classes (SEE, 1995)	6	*BSC Battery – Safr & Hauberer, 2007.*

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Questionnaire on family social capital – first version

Below you will find a series of questions about your family members and your relationship with them. Please, indicate with a cross (X) the most suitable answer for each question, or indicate the requested information.

1. How many people do you live with, in our household?

[ ] 0 None
[ ] 1 1
[ ] 2 2
[ ] 3 3
[ ] 4 4-6
[ ] 5 More than 6

2. Indicate your relationship with each one of them. Use as many lines as the number of people you live with.

Ex. father

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____

3. How many of them do you feel close to?

[ ] 0 None
[ ] 1 1
[ ] 2 2
[ ] 3 3
[ ] 4 4-6
[ ] 5 More than 6

4. What is the number of members of your extended family?

[ ] 0 None
[ ] 1 1 or 2
[ ] 2 3 to 5
[ ] 3 6 to 9
[ ] 4 10 or more

5. Indicate your relationship with each one of them. Use as many lines as the number of relatives you have.

Ex. uncle

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____
13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____
19. _____ 20. _____ 21. _____ 22. _____ 23. _____ 24. _____
25. _____ 26. _____ 27. _____ 28. _____ 29. _____ 30. _____

6. How many of them do you feel close to?

[ ] 0 None
[ ] 1 1 or 2
[ ] 2 3 to 5
[ ] 3 6 to 9
[ ] 4 10 or more

7. Among your extended family, are there members…

	None	1-2	3-5	6-9	More than 10	Unknown
7.1. With different nationalities?						
7.2. With a lower educational background?						
7.3. With a higher educational background?						
7.4. That work in professions that include managerial and senior technical staff and free professionals *such as doctor, lawyer, dentist, high school teacher, veterinary, banker, manager of a large company or similar.*						
7.4. That work in professions that include intermediate occupations and managers in commerce; *such as nurse, kindergarten teacher, administrative, accountant, detective, writer, artist or similar*.						
7.4. That work in professions that include skilled non-manual workers *such as sales agent, contractor, receptionist, farmer, policeman, painter, plumber, or similar.*						
7.4. That work in professions that include skilled and partly skilled manual workers; *such as hair dressers, mechanic, cook, barman, or similar.*						
7.4. That work in professions that include unskilled manual workers *such as construction workers, cleaners, lorry driver or similar.*						
7.5. With different religious beliefs?						
7.6. With different political orientation?						
7.7. With more economic resources?						
7.8. With less economic resources?						

8. How often do you do the following activities with your household family members?
(1 = never; 2 = less than monthly; 3 = monthly; 4 = weekly).

	1	2	3	4
8.1. Going for a walk, going to the movies, to a concert, to a picnic				
8.2. Doing the shopping				
8.3. Sitting and talking				
8.4. Have dinner together				
8.5. Visiting relatives or receiving visits from them				
8.6. Going to church together				
8.7. Going to watch sports events				
8.8. Watching TV shows together				
8.9. Preparing meals together				
8.10. Doing homework together (eg parents helping children, siblings helping each other)				

9. How often do you do the following activities with family members outside your household? (1 = never; 2 = less than monthly; 3 = monthly; 4 = weekly).

	1	2	3	4
9.1. Going for a walk, going to the movies, to a concert, to a picnic.				
9.2. Doing the shopping				
9.3. Sitting and talking				
9.4. Have dinner together				
9.5. Talking on the phone				
9.6. Visiting them or receiving visits from them				

10. What is your level of agreement with the following statements with regard to the family members **inside** your household (1 = completely disagree; 4 = completely agree)

	1	2	3	4
10.1. We work well as a family.				
10.2. In our family it is important to follow the rules.				
10.3. I can rely on my family members for support and help with serious problems.				

11. What is your level of agreement with the following statements with regard to the family members **outside** your household (1 = completely disagree; 4 = completely agree)

	1	2	3	4
11.1. We work well as a family.				
11.2. In our family it is important to follow the rules.				
11.3. I can rely on my family members for support and help with serious problems.				

12. Frequency in which the following situations happen in your family **inside** your household (1 = never; 2 = sometimes; 3= often; 4 = very often)

	1	2	3	4
12.1. People make too many demands				
12.2. Personal goals conflict those of the family				
12.3. Arguing				
12.4. Critiques between family members				

13. Frequency in which the following situations happen in your family **outside** the household (1 = never; 2 = sometimes; 3= often; 4 = very often)

	1	2	3	4
13.1. People make too many demands				
13.2. Personal goals conflict those of the family				
13.3. Arguing				
13.4. Critiques between family members				

11.2. Expert judgment of the model

Four scholars reviewed the first version of the FSCQ and were asked to give their opinion on the adequacy, comprehensibility and clarity of the proposed questions, as well as of the presentation letters and informed consents handed to the participants. A detailed summary of their comments and the respective decisions made accordingly, is shown in Table 9. In addition to these, we decided to change the order of some questions for practical reasons.

The second version of the FSCQ including the experts' feedback is presented in the following pages. This is the version that was presented in the focus group and discussed with the 25 adolescents from INS Pere Borrell and Jesuïtes Casp in the next phase of the validation.

Table 9

Expert judgment feedback and decisions made in response.

	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	*Decisions made on their comments*
1		What about teenagers living in two households? What about emancipated teenagers?			*Given the many different forms that a family can take in current western societies we decide to only refer to 'members of the family inside the household' and 'members of the family outside the household', as it is considered to be the most objective way for everyone. Because of our broad conception of the notion of family and its subjective dimension discussed in the theoretical framework, we opt for not specifying which types of relationship are to be included.* *Siblings living outside the household should be counted as 'family outside the household'.*
2					
3				Maybe it would be interesting to specify what we understand by 'close relationship' by adding an adjective (trust, etc.).	
4		What about siblings living outside the household?		Is any type of relationship included (e.g. second cousins,…?). In any case, it could be specified.	
5		30 lines may not be enough in some cases			
6					
7	7.1. Is it relevant? 7.2. This question is difficult, but I imagine that there is no better way to ask? 7.4. Add additional examples? 7.4. I would write examples that include more categories (e.g. athletes, artists).	It would be necessary to formulate the questions in the same way, as well as considering the frequency of contact with every category family members.	7.4. These are difficult questions, considering that they have to be answered by adolescents with different cultural level. 7.7 & 7.8. Compared to who??	7.4. Is there an alternative way of asking these questions? -Is the proposal of the SEE still valid, considering the changes occurred in the labor market in the last years?	*We decide to maintain the questions as they are, and to test its comprehension during the focus groups in the next sub phase.*

	7.8. This question is very clear, if it can serve as an example for 7.2.			
8	Why not having lunch? And other activities such as reading, playing an instrument, doing handicrafts,	Why not having lunch? Playing? Going to the theater? Having a conversation? Doing the dishes…?	Having a walk maybe indicates a lower degree of shared leisure time. I do not know if it would be necessary to differentiate it. Other activities to be included: practice sports? Go to parties? Theater? Movies? Museums? Add having lunch. Has it to be at home, or eating out would be included?	*Lunch will be included in this question, since is very common in Spain that children/teenagers eat lunch at home.* *The selection of activities will be broadened with their suggestions.*
9				
10		It would be interesting to ask about the existence of family rules regarding: a. Regular bed time b. Limits on screen time c. Rules about dating d. Rules about smoking & drinking e. Rules about using foul language at home f. Supervision of homework		*This questions will be added to the questionnaire.*
11				

12	12.2. The personal goals…. Does it refer to the subject responding the questionnaire or to any member of the family?	I would always use the same term: 'family members' or 'people in my family'.	*The original question refers to any member of the family, as a tendency of the group. Question 12 is reformulated accordingly.*
13	Why don't you ask about positive attitudes or situations? Does the absence of negative situations indicate positive predispositions? Why items 10 and 11 ask about the degree of agreement and 12 and 13 ask about frequency? I miss some more explicit references to concepts such as cohesion and trust within the family	The same as 12.	*The positive aspects of the family relationships are asked in other questions. These items only focus (intentionally) on negative qualities of the family relationships.*

Questionnaire on family social capital – Second version

Below you will find a series of questions about your family members and your relationship with them. Please, indicate with a cross (X) the most suitable answer for each question, or indicate the requested information.

1. How many people do you live with, in our household?

[ ] None
[ ] 1
[ ] 2
[ ] 3
[ ] 4-6
[ ] More than 6

2. Indicate your relationship with each one of them. Use as many lines as the number of people you live with.

For example: If you live with your father and sister, write down '1. Father, 2. Sister'.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____

3. How many of them do you feel close to?

[ ] None
[ ] 1
[ ] 2
[ ] 3
[ ] 4-6
[ ] More than 6

4. What is the number of members of your extended family?

[ ] None
[ ] 1 or 2
[ ] 3 to 5
[ ] 6 to 9
[ ] 10 to 20
[ ] 20 or more

5. Indicate your relationship with each one of them. Use as many lines as the number of relatives you have.

For example: '1. Grandmother; 2. Cousin, etc.'

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____
13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____
19. _____ 20. _____ 21. _____ 22. _____ 23. _____ 24. _____
25. _____ 26. _____ 27. _____ 28. _____ 29. _____ 30. _____

6. How many of them do you feel close to?

[ ] None
[ ] 1 or 2
[ ] 3 to 5
[ ] 6 to 9
[ ] 10 to 20
[ ] 20 or more

7. How often do you do the following activities with your household family members?

	Never	Nearly never	Less than once a month	More than once a month	Once a week	More than once a week
8.1. Going for a walk, going to the movies, to a concert, to a picnic, to a museum, to the theater; watching sports; eating out.						
8.2. Playing, reading, listening to music.						
8.3. Practicing sports.						
8.4. Doing the grocery shopping.						
8.5. Preparing meals together						
8.6. Sitting and talking						
8.7. Visiting relatives or receiving visits from them						

8. How often do you do the following activities with family members outside your household?

	Never	Nearly never	Less than once a month	More than once a month	Once a week	More than once a week
8.1. Going for a walk, going to the movies, to a concert, to a picnic, to a museum, to the theater; watching sports; eating out.						
8.2. Playing, reading, listening to music.						
8.3. Practicing sports.						
8.4. Doing the grocery shopping.						
8.5. Preparing meals together						
8.6. Sitting and talking						
8.7. Talking to them on the phone						

9. Among your extended family, are there members…

	None	1-2	3-5	6-9	More than 10	Unknown	Have you been in touch with them during the last month?	
							YES	NO
9.1. With different nationalities?								
9.2. With a lower educational background?								
9.3. With a higher educational background?								
9.4. That work in professions that include managerial and senior technical staff and free professionals *such as doctor, lawyer, dentist, high school teacher, veterinary, banker, manager of a large company or similar.*								
9.5 That work in professions that include intermediate occupations and managers in commerce; *such as nurse, kindergarten teacher, administrative, accountant, detective, writer, artist or similar*.								
9.6. That work in professions that include skilled non-manual workers *such as sales agent, contractor, receptionist, farmer, policeman, painter, plumber, or similar.*								
9.7. That work in professions that include skilled and partly skilled manual workers; *such as hair dressers, mechanic, cook, barman, or similar.*								
9.8. That work in professions that include unskilled manual workers *such as construction workers, cleaners, lorry driver or similar.*								
9.9. With different religious beliefs?								
9.10. With different political orientation?								
9.11. With more economic resources?								
9.12. With less economic resources?								

10. In our household, we have rules about….

	YES	NO
10.1… bedtime?		
10.2… time we spend watching TV, playing videogames, using the computer…?		
10.3… curfew time?		
10.4… alcohol consumption?		
10.5… tobacco consumption?		
10.6… the kind of food we eat?		

11. What is your level of agreement with the following statements with regard to the family members **inside** your household?

	Never	Rarely	Some-times	Often	Very often	All the time
11.1. We work well as a family.						
11.2. If there is a problem, we act collectively and cooperate to solve it.						
11.3. In our family it is important to follow the rules.						
11.4. I can rely on my family members for support and help with serious problems.						

12. What is your level of agreement with the following statements with regard to the family members **outside** your household?

	Never	Rarely	Some-times	Often	Very often	All the time
12.1. We work well as a family.						
12.2. If there is a problem, we act collectively and cooperate to solve it.						
12.3. In our family it is important to follow the rules.						
12.4. I can rely on my family members for support and help with serious problems.						

13. Frequency in which the following situations happen in your family **inside** your household

	Never	Rarely	Some-times	Often	Very often	All the time
13.1. People make too many demands						
13.2. Personal goals conflict those of the family						
13.3. Arguing						
13.4. Critiques between family members						

14. Frequency in which the following situations happen in your family **outside** the household

	Never	Rarely	Some-times	Often	Very often	All the time
14.1. People make too many demands						
14.2. Personal goals conflict those of the family						
14.3. Arguing						

14.4. Critiques between family members						

11.3. Cognitive validation through focus groups

The results of the two focus groups held in order to assess the comprehension of the items and identify possible clearer reformulations proved a good general understanding of the questionnaire and the different items. Nevertheless, some comments and suggestion were made that allowed to improve the previous version of the questionnaire. Comments made during the first focus group (rural context) were checked during the second one (urban-high) with the aim of overcoming potential context-driven meanings. Table XX summarizes these comments and the decisions made by the research team in agreement.

Table 10

Comments made by the participants in the focus groups and decisions made in agreement.

Question #	**Comments made by the participants in the focus groups**	**Modifications made in agreement**
1	Some adolescents live in two households.	We add a box that adolescents can check to indicate they live in two households.
3, 6	Adding the concept 'confident' makes the question clearer.	We add this notion.
5	Writing down all the relatives' kinship is time-consuming, especially for those with large extended families.	In order to simplify this question but still do not condition the responses of the participants, we add the indication of writing down the type of kinship and, beside, indicating between brackets the number of individuals that comply with this type of relationship.
7	Other examples of activities that the adolescents do with their families include doing home chores or homework.	We include these two types of activities.
9	Question 9 is the most complicated to understand and problematic. Some students say they do not know the educational level of their relatives, yet they do know their occupations and these items are clear. The same way, often they are not aware of the economic resources their relatives have.	To facilitate the comprehension of this question, we simplify this block by just asking whether or not they have any family member outside their households with the different characteristics, instead of intervals. We decide to leave the question about the educational level and to change the items about the economic level by two proxies: times they go on vacation and number of cars they own.
10	They miss a question about home chores.	We include this item.
11.4,12.4	Because most of the adolescents do not have 'serious problems' at this age, they suggest to add also 'important decisions'.	We do this modification.

Questionnaire on family social capital – Third and final version

(English translation: the original version can be found in appendix C)

Below you will find a series of questions about your family members and your relationship with them. Please, indicate with a cross (X) the most suitable answer for each question, or indicate the requested information.

1. How many people do you live with, in our household?
Should you live in two household, add up the persons that live in them and check the indicated box.

[ ] None
[ ] 1
[ ] 2
[ ] 3
[ ] 4-6
[ ] More than 6

[ ] I live in two households

2. Indicate your relationship with each one of them. Write down the different kinship you hold with every one of them and, if necessary, indicate between brackets the number of people you maintain this kinship with.
For example: If you live with your father, mother and two brothers, write down '1. Father, 2. Mother, 3 Brother (2)'.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____

3. How many of them do you feel close and confident to?

[ ] None
[ ] 1
[ ] 2
[ ] 3
[ ] 4-6
[ ] More than 6

4. What is the number of members of your extended family?

[ ] None
[ ] 1 or 2
[ ] 3 to 5
[ ] 6 to 9
[ ] 10 to 20
[ ] 20 or more

5. Indicate your relationship with each one of them. Write down the different kinship you hold with every one of them and, if necessary, indicate between brackets the number of people you maintain this kinship with.

For example: '1. Grandmother; 2. Cousin (3), 3. uncle/aunt (2), etc.'

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____
13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____
19. _____ 20. _____ 21. _____ 22. _____ 23. _____ 24. _____
25. _____ 26. _____ 27. _____ 28. _____ 29. _____ 30. _____

6. How many of them do you feel close and confident to?

[ ] None
[ ] 1 or 2
[ ] 3 to 5
[ ] 6 to 9
[ ] 10 to 20
[ ] 20 or more

7. How often do you do the following activities with your household family members?

	Never	Nearly never	Less than once a month	More than once a month	Once a week	More than once a week
8.1. Going for a walk, going to the movies, to a concert, to a picnic, to a museum, to the theater; watching sports; eating out.						
8.2. Playing, reading, listening to music.						
8.3. Practicing sports.						
8.4. Doing the homework.						
8.5. Doing home chores.						
8.4. Doing the grocery shopping.						
8.5. Preparing meals together						
8.6. Sitting and talking						
8.7. Visiting relatives or receiving visits from them						

8. How often do you do the following activities with family members outside your household?

	Never	Nearly never	Less than once a month	More than once a month	Once a week	More than once a week
8.1. Going for a walk, going to the movies, to a concert, to a picnic, to a museum, to the theater; watching sports; eating out.						
8.2. Playing, reading, listening to music.						
8.3. Practicing sports.						
8.4. Do the grocery shopping.						
8.5. Preparing meals together						
8.6. Sitting and talking						
8.7. Talking to them on the phone						

9. Among your extended family, are there members…

	None	1-2	3-5	6-9	More than 10	Unknown	Have you been in touch with them during the last month?	
							YES	NO
9.1. With different nationalities?								
9.2. With a lower educational background?								
9.3. With a higher educational background?								
9.4. That work in professions that include managerial and senior technical staff and free professionals *such as doctor, lawyer, dentist, high school teacher, veterinary, banker, manager of a large company or similar.*								
9.5 That work in professions that include intermediate occupations and managers in commerce; *such as nurse, kindergarten teacher, administrative, accountant, detective, writer, artist or similar*.								
9.6. That work in professions that include skilled non-manual workers *such as sales agent, contractor, receptionist, farmer, policeman, painter, plumber, or similar.*								
9.7. That work in professions that include skilled and partly skilled manual workers; *such as hair dressers, mechanic, cook, barman, or similar.*								
9.8. That work in professions that include unskilled manual workers *such as construction workers, cleaners, lorry driver or similar.*								
9.9. With different religious beliefs?								
9.10. With different political orientation?								
9.11. With more economic resources?								
9.12. With less economic resources?								

10. In our household, we have rules about….

	YES	NO
10.1… bedtime?		
10.2…our contribution in home chores?		
10.3… time we spend watching TV, playing videogames, using the computer…?		
10.4… curfew time?		
10.5… alcohol consumption?		
10.6… tobacco consumption?		
10.7… the kind of food we eat?		

11. What is your level of agreement with the following statements with regard to the family members **inside** your household?

	Never	Rarely	Some-times	Often	Very often	All the time
11.1. We work well as a family.						
11.2. If there is a problem, we act collectively and cooperate to solve it.						
11.3. In our family it is important to follow the rules.						
11.4. I can rely on my family members for support and help with serious problems or important decisions.						

12. What is your level of agreement with the following statements with regard to the family members **outside** your household?

	Never	Rarely	Some-times	Often	Very often	All the time
12.1. We work well as a family.						
12.2. If there is a problem, we act collectively and cooperate to solve it.						
12.3. In our family it is important to follow the rules.						
12.4. I can rely on my family members for support and help with serious problems or important decisions.						

13. Frequency in which the following situations happen in your family **inside** your household

	Never	Rarely	Some-times	Often	Very often	All the time
13.1. People make too many demands						
13.2. Personal goals conflict those of the family						
13.3. Arguing						
13.4. Critiques between family members						

14. Frequency in which the following situations happen in your family **outside** the household

	Never	Rarely	Some-times	Often	Very often	All the time
14.1. People make too many demands						
14.2. Personal goals conflict those of the family						
14.3. Arguing						
14.4. Critiques between family members						

11.4. Psychometric assessment

After including the pertinent modifications according to the focus group, the third version of the FSCQ was implemented in the four high-schools in order to assess its psychometric properties. A total of 195 adolescents filled up the questionnaire, of which 193 were valid. 59 of these adolescents also participated in a test-retest assessment.

a. Reliability analysis: internal and temporal consistency.

Internal consistency was measured for the whole scale as well as for the different dimensions of family social capital we were trying to measure, namely, structural family social capital, cognitive family social capital and bridging social capital. Of the total 195 questionnaires, 165 (84.6%) were considered valid. All α were above 0.8, indicating optimal reliability, except for bridging social family social capital and negative family social capital which had an α of .773 and .796, respectively. Still, this value is considered as adequate, and their lower scores actually reflect the formative nature of these subscales.

Table 11 shows the alphas for the different dimensions as well as the items included in each of them. For each of the subscales as well as for the overall mark, we also looked at changes in Cronbach's alpha if items were deleted: no scale improved its internal consistency by deleting items.

Table 11

Results of the internal consistency assessment of the FSCQ using Cronbach's alpha.

Dimension - items	**Cronbach's α**
Structural family social capital V14 V16 V15 V17 V18 V19 V20 V21 V22 V23 V24 V25 V26 V27 V28 V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60 V61 V62 V63 V64 V65 V66	.854
Cognitive family social capital V10 V13 V67 V68 V69 V70 V71 V72 V73 V74	.825
Bridging family social capital V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59	.773
Negative family social capital V75 V76 V77 V78 V79 V80 V81 V82	.796
Overall family social capital score V10 V13 V14 V15 V16 V17 V18 V19 V20 V21 V22 V23 V24 V25 V26 V27 V28 V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60 V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V75 V76 V77 V78 V79 V80 V81 V82	.869

An intra-class correlation coefficient analysis of the overall score was conducted in order to evaluate test-retest reliability. Using a two-way random single measure, the result was CCI=.858 (CI95%: .772-.913), which indicates excellent temporal consistency.

b. Construct validity analysis:

To measure construct validity, we run a confirmatory factorial analysis considering the structural and cognitive scale. In this case, bridging family social capital was only considered as a subdimension of structural social capital. Goodness-of-fit was assessed through the RMSEA, CFI/TLI and Chi-squared test. All of them showed a not ideal, yet acceptable fit for both scales. For the structural scale, RMSEA was 0.097 (p=.000), CFI 0.718 and TLI 0.703. With regard to cognitive SC, RMSEA was 0.162 (p=.000), CFI 0.788 and TLI 0.740.

Taking into account the considerations made in the methodology section, these weak indicators are most likely due to the dual reflective/formative nature of our instrument and the large number of items of our questionnaire.

12. Results of the quantitative study

As previously mentioned, this phase's results are retrieved from the responses of 258 adolescents to a questionnaire including sociodemographic questions, along with a lifestyle questionnaire, the KIDMED questionnaire, the Family Social Capital Questionnaire and other 6 items assessing social capital in the school, family and neighborhood context.

12.1. Descriptive statistics

It is extensively accepted that prior to undertaking more complex analysis, it is necessary to understand the empirical features of measures, such as statistics of dispersion and central tendency, and patterns of association of the variables (Kothari, 2004; Sabo & Boone, 2013). In this section we provide a summary of the descriptive statistics of our variables.

Table 12, Table 13, Table 14 and Table 15 show, respectively, the sociodemographic characteristics of the sample, results for the KIDMED index, results for the other health-related variables and for social capital items, considering the whole sample and the 4 subgroups. Results are expressed in percentage (%) in the case of nominal or ordinal variables, while means and SDs are used for continuous variables.

The four groups selected represented different socioeconomic contexts: rural; urban-high income (here after urban-high); urban-medium income (urban-medium); and urban-low income (urban-low). Although they differed in terms of size, all the groups had similar composition in terms of gender, with approximately half of the sample being female. The other sociodemographic characteristics, namely the adolescents and their parent's origin, and family SES measured through parental education level (mother's, father's, and then a household aggregated measure built by considering the highest educational level achieved by any of the parents) showed differences that reflected the characteristics of the four contexts, as sought by the purposeful sampling. We observed that while immigrant adolescents represented less than 20% of the rural (15.46%) and urban-high (13.46%) groups, they constituted 43.66% of the cases of the urban-medium and 76.32% of the urban-low groups. This pattern was consistent in the case of parental origin: adolescents with at least a non-Spanish parent accounted for less than 25% in our rural and urban-high samples, whereas this percentage increased to almost 60% in the urban-medium and more than 80% in the urban-low contexts.

Table 12

Sociodemographic characteristics of the sample in study 1.

	SES context				
	Rural 97 (37.6%)	**Urban-High 52 (20.2%)**	**Urban-Med 71 (27.5%)**	**Urban-Low 38 (14.7%)**	**TOTAL 258 (100%)**
Gender					
Male	40 (41.24)	26 (50)	42 (59.15)	18 (47.37)	126 (48.84)
Female	57 (58.76)	26 (50)	29 (40.85)	20 (52.63)	132 (51.16)
AdolAutoc					
Autoctonous	82 (84.54)	45 (86.54)	40 (56.33)	9 (23.68)	176 (68.22)
Immigrant	15 (15.46)	7 (13.46)	31 (43.66)	29 (76.32)	82 (31.78)
ParentsAutoc					
Autoctonous	75 (77.32)	43 (82.69)	29 (40.85)	7 (18.42)	154 (59.69)
Immigrant	22 (22.68)	9 (17.30)	42 (59.15)	31 (81.58)	104 (40.31)
EducMother					
No schooling	3 (03.09)	0	0	4 (10.53)	7 (2.71)
Primary studies	25 (25.77)	0	11 (15.49)	15 (39.47)	51 (19.77)
Compulsory secondary school	6 (06.19)	0	2 (02.82)	3 (07.89)	11 (04.26)
Post-compulsory secondary school	16 (16.50)	6 (11.54)	13 (18.31)	1 (02.63)	36 (13.95)
Unfinished university	16 (16.50)	3 (05.77)	12 (16.90)	3 (07.89)	34 (13.18)
University studies	27 (27.84)	43 (82.69)	31 (59.62)	3 (07.89)	104 (40.31)
Missing	4 (04.12)	0	2 (02.82)	9 (23.69)	15 (05.81)
EducFather					
No schooling	5 (05.15)	0	0	4 (10.53)	9 (03.49)
Primary studies	25 (25.77)	0	12 (16.90)	13 (34.21)	50 (19.38)
Compulsory secondary school	10 (10.31)	3 (05.77)	5 (07.04)	1 (02.63)	19 (07.36)
Post-compulsory secondary school	21 (21.65)	1 (01.92)	12 (16.90)	3 (07.89)	37 (14.34)
Unfinished university	9 (09.28)	2 (03.85)	7 (09.86)	1 (02.63)	19 (07.36)
University studies	18 (18.56)	45 (86.54)	34 (47.89)	12 (31.58)	109 (42.25)
Missing	9 (09.28)	1 (01.92)	1 (1.41)	4 (10.53)	15 (05.81)
HighEducHousehold					
No schooling	2 (02.06)	0	0	1 (02.63)	3 (1.16)
Primary studies	19 (19.59)	0	7 (09.86)	13 (34.21)	39 (15.12)
Compulsory secondary school	6 (06.19)	0	4 (05.63)	3 (07.89)	13 (05.04)
Post-compulsory secondary school	18 (18.56)	3 (05.77)	8 (11.27)	2 (05.26)	31 (12.02)
Unfinished university	14 (14.43)	2 (03.85)	7 (09.86)	1 (02.63)	24 (09.30)
University studies	35 (36.08)	47 (90.38)	44 (61.97)	14 (36.84)	140 (54.26)
Missing	3 (03.09)	0	1 (01.41)	4 (10.53)	8 (03.10)
Family type in the household					
Single-parent family	16 (16.49)	4 (07.84)	7 (01.00)	12 (35.29)	39 (15.12)
Only-child	13 (13.40)	8 (15.69)	11 (15.71)	1 (02.86)	33 (12.79)
Two siblings	26 (26.80)	16 (31.37)	22 (30.99)	5 (14.29)	69 (26.74)
Large family	14 (14.43)	18 (35.29)	12 (17.14)	9 (25.71)	53 (20.54)
Extended Family	18 (18.56)	2 (03.91)	10 (14.29)	6 (17.14)	36 (13.95)
Step family	9 (09.28)	2 (03.91)	6 (08.57)	2 (05.71)	19 (07.36)
Others	1 (01.03)	1 (01.96)	2 (02.86)	0	4 (01.55)
Missing	0	1 (01.96)	1 (01.43)	3 (08.57)	5 (01.94)

With regard to the highest educational level achieved by the parents, dissimilarities between groups were also obvious: the percentage of households where the highest parental educational level achieved is university studies was of 90.38% in the case of the urban-high group, 61.97% in

the urban-medium, and around 36% in both the urban-low and the rural groups. A significant difference between these two last groups was the distribution of the other categories: the urban-low was sharply polarized, with another third of the sample falling within the 'primary studies' category. On the contrary, the rural group showed a much more levelled distribution, which reflected the variety of socioeconomic levels that were included in this group. It is also interesting to mention that in the case of the urban-high group, no adolescent had parents whose highest educational level was below post-compulsory secondary school, while it accounted between 15 and approximately 44% in the other groups.

Family composition within the household also showed some variation between the four groups. Single-parent families represented the 16.49% in the rural group, in front of the 07.84% in the urban-high, 1% in the urban-medium and 35.29% in the urban-low. On the contrary, only-child and two siblings' families were less present in the urban-low group (02.86% and 25.71), while in the other three groups accounted by around 15% and 30%, respectively. Large families were more common among the urban-high (35.29%) and urban-low (25.71%) groups and extended families accounted between 14.29% and 18.56% in all the groups except for the urban-high, which had less than 4%. Step families were below 10% in all cases, being less common in the urban-high (03.91%) and urban-low (05.71%) groups.

Although these differences in the sociodemographic variables could be seen as a lack of consistency between the four groups, they actually represent the reality of the contexts that have been chosen to be studied.

As far as health-related variables are concerned, differences were noticeably less evident than with regard to the sociodemographic characteristics. In the overall sample, the prevalence of overweight or obesity according to the self-reported measures of the participants was of 15.89%. Along the four groups, BMI exhibited an inconsistent pattern: the highest prevalence was found in the rural group (19.59%), while the lowest appeared in the urban-low group (07.89%). Urban-high and urban-medium displayed 13.46% and 16.90% of overweight or obesity, respectively.

It is important to note that in the case of the urban-low group a 21.05% of the sample did not reported either weight and/or height measures, so BMI could not be calculated, which constitutes and important loss of information and a potential source of bias for the low prevalence of obesity and overweight in this group. Bearing this fact in mind, significant differences in reported BMI between groups were not found by one-way ANOVA (Welch's adjusted F ratio=.707, p=.550).

SRH differences between groups were more evident at the high and low ends of the scale. In average, less than 10% of the sample considered to have average or bad health, with the grater bulk of participants considering their health 'very good' or 'good'. However, when looking at the different groups, 23.94% of urban-medium participants rated their health as 'excellent', compared to 10.53% in the case of low-income and around 18% in the other two groups. At the same time, 'average' and 'bad' health was perceived by around 10% in the rural and urban-high groups, in opposition to less than 4% in the urban-medium and 3% in the urban-low. There was a statistically a weak but significant association between SRH and SES context, as shown by the chi square test and Cramer's V (χ^2= 8.221, p=.042; ϕ=.180, p=.042), however, one-way ANOVA did not show statistically significant differences between groups (F(3)=1.873, p=.135).

Table 13

BMI and VISA-TEEN descriptive results for each of the four socioeconomic contexts and for the overall sample.

	SES context				
	Rural	**Urban-High**	**Urban-Med**	**Urban-Low**	**TOTAL**
	97 (37.6%)	**52 (20.2%)**	**71 (27.5%)**	**38 (14.7%)**	**258 (100%)**
BMICateg					
Underweight	5 (05.15)	4 (07.69)	1 (01.41)	1 (02.63)	11 (4.26)
Normoweight	62 (63.92)	39 (75.00)	56 (78.87)	26 (68.42)	183 (70.93)
Overw or obese	19 (19.59)	7 (13.46)	12 (16.90)	3 (07.89)	41 (15.89)
Missing	11 (11.34)	2 (03.85)	2 (02.82)	8 (21.05)	23 (08.91)
SRH					
Excellent	18 (18.56)	9 (17.31)	17 (23.94)	4 (10.53)	48 (18.60)
Very good	32 (32.99)	20 (38.46)	31 (43.66)	10 (26.32)	93 (36.05)
Good	37 (38.14)	18 (34.62)	20 (28.17)	20 (52.63)	95 (36.82)
Average	10 (10.31)	3 (05.77)	2 (02.82)	1 (2.63)	16 (06.20)
Bad	0	2 (03.85)	1 (01.41)	0	3 (01.16)
VT_TOTAL					
$\overline{X}$ **(SD)**	34.66(4.89)	34.17(4.15)	36.29(4.25)	36.17(4.51)	35.21(4.58)
VT_Nutrition					
$\overline{X}$ **(SD)**	2.13(0.52)	2.27(0.44)	2.16(0.37)	1.8(0.59)	2.13(0.49)
VT_PhysAct					
$\overline{X}$ **(SD)**	1.99(1.06)	2.13(1.05)	2.17(0.95)	2.1(1.1)	2.08(1.03)
VT_RUTL					
$\overline{X}$ **(SD)**	2.24(0.51)	2.22(0.44)	2.24(0.5)	2.22(0.6)	2.22(0.5)
VT_ToxicHab					
$\overline{X}$ **(SD)**	2.57(0.58)	2.31(0.64)	2.76(0.56)	2.89(0.29)	2.62(0.59)
VT_Hygiene					
$\overline{X}$ **(SD)**	2.49(0.53)	2.25(0.74)	2.46(0.64)	2.54(0.55)	2.44(0.61)

Lifestyle total scores (VT_TOTAL) were very similar in the four groups, and differences were not statistically significant according to one-way ANOVA results (F(3)=1.710, p=.166). The mean for the whole sample was 35.21±4.58, out of the 45 possible points. The lowest mark belonged to the urban-high group (34.17±4.15), whereas the urban-medium group held the highest mark

(35.29±4.25). A closer look at the subdimensions of this index allows to understand these slight differences. The mark of the five subdimensions in this scale range from 0 to 3. On average, urban-high adolescents in our sample got the highest mark on nutrition (2.27±0.44 vs 1.8±0.59 in the urban-low group). However, they also had the lowest scores in toxic habits (2.31±0.64 vs 2.89±0.29 in the urban-low group) and hygiene (2.25±0.74 vs 2.54±0.55 in the urban-low group). RUTL scores were much more similar between the four groups, with an average mark of 2.22±0,5. The highest mark for physical activity was 2.17±0.95 in the urban-medium group, compared to 1.99±1.06 in the rural group. For the whole sample, physical activity had the lowest rate of the five subdimensions (2.08±1.03). Differences between groups were only significant for *VT_Nutrition* (F(3)=4.301, p=.007) and *VT_ToxicHab* (F(3)=12.480, p=.000). For *VT_Nutrition,* post hoc comparisons using the Tukey HSD test indicated that the mean score for the urban-low group was significantly different than all the other groups. However, marks for the other three contexts did not differ significantly. As for *VT_ToxicHab,* Games-Howell test identified significant differences between urban-low and all the other three groups, on one hand, and urban-high and urban-medium, on the other. Differences between all the other combinations were not significant.

The KIDMED scale ranges from 0 to 12, and scores are classified into three categories: Low quality diet (≤3); medium quality diet (4-7), high quality diet (>8). In our sample, only 13.57% fell into the high quality diet category, being the mean value 5.27±1.95. The highest marks were for the urban-low and rural groups (6.03±0.44 and 5.22 ±2.04, respectively), and the lowest for the urban-high group (4.96±1.85). In all the cases, though, marks were below or just slightly above the 50% of the possible maximum mark and not significantly different between them (Welch's adjusted F ratio=.303, p=.823). 23.68% of the urban-low had a good quality diet, in comparison to only the 07.69% in the urban-high group and 08.86% in the urban-medium. Again, a look into the different items allows a greater understanding of these differences. One of the particularities of the KIDMED index is the fact that the all the questions are equally pondered, so it is possible that higher total marks appear in the group with the lowest intake of 2nd piece of fruit or the highest consumption of candies and fast food, as it is our case. This fact also explains the inconsistent results obtained from the KIDMED index and the Nutrition subdimension in the lifestyle questionnaire, because the latter focus in the relative consumption of the different food groups with regard to the nutritional pyramid (Costa-Tutusaus, 2014), so the overall mark is more sensitive to one person's overall diet pattern. On the other hand, the KIDMED index allow to assess specific behaviors that are related to a healthy diet, such as the consumption of healthier food groups such as fruit and vegetables, fish, nuts or dairy or the unhealthy habits of skipping breakfast or eating fast food or candies regularly.

In the urban-low group only 36.84% of the group ate two pieces of fruit per day, while this percentage increased to 47.42% and 53.85%, respectively, in the case of the rural and urban-high groups. An interesting data, is the fact that while the percentage of adolescents in the urban-low group that ate one daily portion of vegetables was the lowest of our sample (52.36% vs 60.07% in the rural group and around 65% in the other two), it is the group with the highest consumption of a second portion of vegetables (44.74% vs 28.85% in the urban-high group). Although both responses are not individually paired, it seems to suggest that urban-low adolescents rather do not eat vegetables regularly or eat more than on portion.

The recommendation of eating fish 2-3 times per week was only met by the 58.53% of our sample, with important variations between groups: only one in two adolescents in the urban-low group achieved this intake, in comparison to 65,38% of the sample in the urban-high, roughly 62% in the urban-medium group. Only 55.67% of the rural sample ate the minimum recommended amount of fish. The consumption of pulses at least twice per week was higher in the urban-medium and rural groups (69.01%, 59.79%) than in the urban-high and urban-low groups (46.14%, 44.74%). Also the urban-low group showed the lowest consumption of olive oil (76.32%) when compared with the other three groups, all above 90%. These differences might be the result of the different composition of the four groups in terms of immigration population, where families may have different eating cultural traditions (especially with regard to olive oil), or of the different economic/cultural backgrounds in the case of fish, which is considered an expensive product (Antentas & Vivas, 2014; Brinkman, de Pee, Sanogo, Subran, & Bloem, 2010). In contrast, almost 45% of the low-income group referred eating dried fruits 2-3 times per week, a figure that dropped to 38%, 14%, 32.39% and 21.15% in the case of rural, urban-medium and urban-high groups, respectively. Nuts have also a reputation of being expensive food products, and while now the consumption of non-processed dried fruits like almonds, hazelnuts and nuts is encouraged, recommendation on their intake has traditionally been that of controlling or even avoiding its consumption because of their high energetic and fat content. So, we hypothesize that the higher consumption on the urban-low group can be related, on the one hand, to the inclusion of some sort of snacks that are not actually dried fruits, but are popularly considered so, as fried corn and other snacks. On the other, it could also be a consequence of dried fruits' *reputation* of being very energetic, which could be more rooted in the high-income groups.

Despite the relevance of dairy products as a source of calcium to meet the high requirements during adolescence, only 26.32% of the urban-low group manifested consuming 2 servings of yogurt or cheese daily, while in all the other groups this percentage was above 60% (almost 70% in the case of the urban-high group).

Other dissimilarities between groups concerned the consumption and composition of breakfasts. While breakfast skippers accounted for less than 13% in the urban-high and urban-medium groups, this percentage raised to 25.77% and 52.63%, respectively, for the rural and urban-low group. Also the intake of dairy products and cereals in this meal was lower among the adolescents in the urban-low group, who also showed a higher regular consumption of pastry in their breakfast (36.84%).

Last, the share of rural adolescents that consumed fast food at least once a week was of 11.34%, when compared to the 14.08% in the urban-medium, 21.15% in the urban-high and 39.47% in the urban-low. Moreover, participants in the urban-low group also referred a quite high intake of candies (34.21% of them eat candies almost daily). Less than 6% of the adolescents in the urban high, 11% of the rural and 15% of the urban-medium said so.

In order to assess whether the different items of the KIDMED index were associated with context SES, we run a chi-square test for each of the items. Except for *olive oil,* all expected cell frequencies were greater than five. Significant associations with context SES were found in the case of eating a 2nd piece of fruit (χ^2= 8.003 p=.045; ϕ=.180, p=.045); consuming fast food more than once a week (χ^2= 17.366 p=.001; ϕ=.265, p=.001); eating pulses 2-3 times per week (χ^2= 7.867 p=.049; ϕ=.178, p=.049); pasta or rice intake 5 or more days per week (χ^2= 8.490 p=.037; ϕ=.185, p=.037); not having breakfast regularly (χ^2= 26.008 p=.000; ϕ=.324, p=.000); eating pastry for breakfast (χ^2= 10.133 p=.017; ϕ=.202, p=.017) and consumption of nuts 2-3 times per week (χ^2= 8.347 p=.039; ϕ=.183, p=.039). In the case of olive oil, because data did not meet the criteria for asymptotic calculus, we used the Monte-Carlo method to assess associations between olive oil consumption and context SES. According to our results, there is a moderate relationship between these two variables (χ^2= 22.549 p=.000; ϕ=.296, p=.000).

Overall, these results indicate that there is a wide room for improvement in the diet of our sample, and that actions to promote healthy eating should tap into different dietary behaviors in each of the groups.

Table 14

KIDMED descriptive results for each of the four socioeconomic contexts and for the overall sample.

	SES context				
	Rural 97 (37.6%)	**Urban-High 52 (20.2%)**	**Urban-Med 71 (27.5%)**	**Urban-Low 38 (14.7%)**	**TOTAL 258 (100%)**
Fruit1					
No	24 (24.74)	8 (15.38)	24 (33.80)	12 (31.58)	68 (26.36)
Yes	73 (75.26)	44 (84.62)	47 (66.20)	26 (68.42)	190 (73.64)
Fruit2					
No	51 (52.58)	24 (46.15)	48 (67.61)	24 (63.16)	147 (56.98)
Yes	46 (47.42)	28 (53.85)	23 (32.39)	14 (36.84)	111 (43.02)
Vegetabl1					
No	30 (30.93)	18 (34.62)	25 (35.21)	18 (47.37)	91 (35.27)
Yes	67 (69.07)	34 (65.38)	46 (64.79)	20 (52.36)	167 (64.73)
Vegetabl2					
No	64 (65.98)	37 (71.15)	48 (67.61)	21 (55.26)	170 (65.89)
Yes	33 (34.02)	15 (28.85)	23 (32.39)	17 (44.74)	88 (34.11)
Fish					
No	43 (44.33)	18 (34.62)	27 (38.03)	19 (50.00)	107 (41.47)
Yes	54 (55.67)	34 (65.38)	44 (61.97)	19 (50.00)	151 (58.53)
FastFood					
No	86 (88.66)	41 (78.85)	61 (85.92)	23 (60.53)	211 (81.78)
Yes	11 (11.34)	11 (21.15)	10 (14.08)	15 (39.47)	47 (18.22)
Pulses					
No	39 (40.21)	28 (53.85)	22 (30.99)	21 (55.26)	110 (42.64)
Yes	58 (59.79)	24 (46.15)	49 (69.01)	17 (44.74)	148 (57.36)
PastaRice					
No	57 (58.76)	23 (44.23)	35 (49.30)	16 (42.11)	131 (50.78)
Yes	40 (41.24)	29 (55.77)	36 (50.70)	22 (57.89)	127 (49.22)
BreakfCereal					
No	34 (35.05)	9 (17.31)	17 (23.94)	16 (42.11)	76 (29.46)
Yes	63 (64.95)	43 (82.69)	54 (76.06)	22 (57.89)	182 (70.54)
Nuts					
No	60 (61.86)	41 (78.85)	48 (67.61)	21 (55.26)	170 (65.89)
Yes	37 (38.14)	11 (21.15)	23 (32.39)	17 (44.74)	88 (34.11)
OliveOil					
No	3 (03.09)	5 (09.62)	1 (01.41)	9 (23.68)	18 (06.98)
Yes	94 (96.91)	47 (90.38)	70 (98.59)	29 (76.32)	240 (93.08)
NOBreakfast					
No	72 (74.23)	46 (88.46)	59 (83.10)	18 (47.37)	195 (75.58)
Yes	25 (25.77)	6 (11.54)	12 (12.90)	20 (52.63)	63 (24.42)
BreakfDairy					
No	37 (38.14)	16 (30.77)	26 (36.62)	17 (44.74)	96 (37.21)
Yes	60 (61.86)	36 (69.23)	45 (63.38)	21 (55.26)	162 (62.79)
BreakPastry					
No	82 (84.54)	43 (82.69)	57 (80.28)	24 (63.16)	206 (79.84)
Yes	15 (15.46)	9 (17.31)	14 (19.72)	14 (36.84)	52 (20.16)
YogCheese					
No	53 (54.64)	30 (57.69)	44 (61.97)	28 (73.68)	155 (60.08)
Yes	44 (45.36)	22 (42.31)	27 (39.03)	10 (26.32)	103 (39.92)
Candies					
No	87 (89.69)	49 (94.23)	61 (85.92)	25 (65.79)	222 (86.05)
Yes	10 (10.31)	3 (5.77)	10 (14.08)	13 (34.21)	36 (13.95)
KIDMED $\overline{X}$ **(SD)**	5.22(2.04)	4.96(1.85)	5.20(1.84)	6.03(1.96)	5.27(1.95)
KIDMEDCat					
Low	22 (22.68)	12 (23.08)	12 (16.90)	8 (21.05)	54 (20.93)
Average	60 (61.86)	36 (69.23)	52 (73.24)	21 (55.26)	169 (65.60)
Good	15 (15.46)	4 (07.69)	7 (09.86)	9 (23.68)	35 (13.57)

Turning to social capital indicators, we present here the results for the 6-item scale on social capital in different domains, and also for the constructs and main dimensions of the FSCQ. In the first case, participants responded six five-point likert-scale items about social capital in their family (1 item), school (3 items) and neighborhood (2 items). With the aim to use this information on the subsequent regressions, responses were dichotomized into low (1-3) or high (4-5) for each question, and then grouped by the domain following the next procedure in the case of neighborhood and school social capital: those participants with 'high' scores in two of the two or three questions respectively were considered to have 'high school social capital' in comparison to the rest of adolescents. The three domains' marks were then grouped into a final overall social capital score that was dichotomized into 'high social capital' when they had 'high' social capital in all three domains and 'low social capital' in all the other cases.

Table 15

Social capital descriptive results for each of the four socioeconomic contexts and for the overall sample.

	SES context				
	Rural 97 (37.6%)	**Urban-High 52 (20.2%)**	**Urban-Med 71 (27.5%)**	**Urban-Low 38 (14.7%)**	**TOTAL 258 (100%)**
FSCQ_NormsBed					
No	51(52.58)	30(57.69)	30(42.25)	19(50.00)	130(50.39)
Yes	43(44.33)	21(40.39)	40(56.34)	13(22.41)	117(45.35)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_NormsScreen					
No	66(68.04)	28(53.85)	38(53.52)	19(50.00)	151(58.53)
Yes	2828.87)	23(44.23)	32(45.07)	13(34.21)	96(37.21)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_NormsCurfew					
No	17(17.53)	17(32.69)	14(19.72)	6(15.79)	54(20.93)
Yes	77(79.38)	34(65.39)	56(78.87(	26(68.42)	193(74.81)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_NormsAlcohol					
No	21(21.65)	8(15.39)	12(16.90)	14(36.84)	55(21.38)
Yes	73(75.26)	43(82.69)	58(81.69)	18(47.37)	192(74.42)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_NormsTobacco					
No	23(23.71)	9((17.31)	10(14.08)	13(34.21)	55(21.32)
Yes	71(73.20)	42(80.77)	60(84.51)	19(50.00)	192(74.42)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_NormsFood					
No	42(43.30)	18(34.62)	27(38.03)	18(47.37)	105(40.70)
Yes	52(53.61)	33(63.46)	43(60.56)	14(36.84)	142(55.04)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_NormsChores					
No	24(24.74)	14(26.92)	18(25.35)	9(23.68)	65(25.19)
Yes	70(72.16)	37(71.16)	52(73.24)	23(60.53)	182(70.54)
Missing	3(03.09)	1(01.92)	1(01.41)	6(15.79)	11(04.26)
FSCQ_SocInt_HH					
$\overline{X}$ (SD)	16.14(4.50)	14.77(5,09)	15.44(4.52)	15.11(4.7)	15.52(4.66)
FSCQ_SocInt_OH					
$\overline{X}$ (SD)	7.47(4.55)	6.46(3.86)	6.59(3.51)	7.41(5.73)	7.01(4.34)

FSCQ_ColEff_HH					
$\overline{X}$ (SD)	7.14(2.52)	5.92(2.10)	7.23(2.2)	6.82(2.93)	6.87(2.45)
FSCQ_ColEff_OH					
$\overline{X}$ (SD)	6.75(2.85)	6.12(2.48)	6.76(2.74)	4.97(3.52)	6.38(2.89)
FSCQ_InfContr_HH					
$\overline{X}$ (SD)	3.22(1.48)	3.33(1.13)	3.28(1.32)	3.26(1.46)	3.27(1.36)
FSCQ_InfContr_OH					
$\overline{X}$ (SD)	2.73(1.82)	2.53(1.42)	2.67(1.62)	2.26(1.73)	2.61(1.67)
FSCQ_Belong_HH					
$\overline{X}$ (SD)	6.19(2.54)	5.70(2.70)	6.45(2.21)	6.50(2.06)	6.21(2.42)
FSCQ_Belong_OH					
$\overline{X}$ (SD)	5.74(2.39)	4.37(2.71)	6.07(2.55)	4.06(3.00)	5.32(2.70)
FSCQ_NegSS_HH					
$\overline{X}$ (SD)	-2.77(2.21)	-4.22(2.07)	-2.29(1.88)	-2.82(3.03)	-2.94(2.32)
FSCQ_NegSS_OH					
$\overline{X}$ (SD)	-2.52(2.56)	-3.17(1.99)	-2.04(1.99)	-2.27(2.59)	-2.48(2.29)
FSCQ_SocIntTOTAL					
$\overline{X}$ (SD)	23,88(7.14)	21.23(7.67)	22.03(7.16)	22.53(7.97)	22.62(7.41)
FSCQ_NormsTOTAL					
$\overline{X}$ (SD)	4.40(1.60)	4,57(1,65)	4,87(1,58)	3,94(1,72)	4,51(1.64)
FSCQ_ColEffTOTAL					
$\overline{X}$ (SD)	13.92(4.58)	12.04(3.38)	14.01(4.15)	11.79(4.66)	13.27(4.33)
FSCQ_InfContrTOTAL					
$\overline{X}$ (SD)	5.96(2.96)	5.86(1.96)	5.97(2.59)	5.53(2.44)	5.88(2.59)
FSCQ_BelongTOTAL					
$\overline{X}$ (SD)	12.00(4,75)	10.12(4,72)	12.53(4.23)	10.56(3.82)	11.57(4,45)
FSCQ_NegSSTOTAL					
$\overline{X}$ (SD)	-5.31(4.26)	-7.39(3.09)	-4.34(3.41)	-5.09(5.52)	-5.43(4.14)
FSCQ_STRUCTURAL					
$\overline{X}$ (SD)	32.5(9.19)	29.47(8.75)	31.67(8.52)	29.5(9.40)	31.23(8.98)
FSCQ_COGNITIVE					
$\overline{X}$ (SD)	31.94(10.4)	28.08(7.93)	32.51(9.31)	27.88(9.46)	30.75(9.65)
FSCQ_BRIDG_OH					
$\overline{X}$ (SD)	28.6(12.6)	23.04(9.38)	29.06(11.54)	21.60(14.56)	26.58(12.32)
FSCQ_FSC_HH					
$\overline{X}$ (SD)	34.40(10.11)	30.49(9.25)	35.21(9.31)	31.98(9.92)	33.51(9.80)
FSCQ_FSC_OH					
$\overline{X}$ (SD)	24.64(10.67)	19.72(8.29)	24.71(9.59)	19.13(12.72)	10.47(0.63)
FSCQ_TOTAL					
$\overline{X}$ (SD)	59.67(17.28)	50.41(14.91)	60.17(16.11)	52.28(16.94)	56.89(16.86)
SCFam					
Low	12 (12.37)	9 (17.31)	5 (07.04)	4 (10.51)	30 (11.63)
High	82 (84.54)	43 (84.54)	64 (90.14)	30 (78.95)	219 (84.88)
Missing	3 (03.09)	0	2 (02.82)	4 (10.53)	9 (03.49)
SCNeigh					
Low	41 (42.27)	25 (48.08)	25 (35.21)	17 (44.74)	108 (41.86)
High	53 (54.64)	27 (51.92)	44 (61.97)	17 (44.74)	141 (54.65)
Missing	3 (03.09)	0	2 (02.82)	4 (10.53)	9 (03.49)
SCSchool					
Low	10 (10.31)	3 (5.77)	5 (7.04)	3 (07.89)	21 (08.14)
High	84 (86.06)	49 (94.23)	64 (90.14)	31 (81.58)	228 (88.37)
Missing	3 (03.09)	0	2 (02.82)	4 (10.53)	9 (03.49)
SCTOTAL					
Low	47 (48.45)	28 (53.85)	28 (39.44)	17 (44.74)	120 (46.51)
High	47 (48.45)	24 (46.31)	41 (57.7%)	17 (44.74)	129 (50.00)
Missing	3 (03.09)	0	2 (02.82)	4 (10.53)	9 (03.49)

According to this classification, the percentage of adolescents with high levels of overall social capital (SCTOTAL) accounted for a 50% of the sample. The highest rates are shown in the urban-medium group (57.7%), and the lowest in the urban-low group (44.74%). If we look at the different domains, high levels of school and family social capital are found in more than 85% of the sample, while high neighborhood social capital values are only manifested by around a 54% of the sample. Again, urban low-group exhibit the lower marks in all three domains, and urban-medium shows the highest prevalence of high social capital in all domains except for school social capital, which are higher in the urban-high group. Chi square tests for the total and subdimensions' scores did not show association between social capital marks and context SES [SCFam χ^2= 2.915 p=.405; ϕ=.108, p=.405; SCNeigh χ^2= 2.512, p=.473; ϕ=.101, p=.473; SCSchool χ^2= 1.253, p=.740; ϕ=.071, p=.740; SCTOTAL χ^2= 2.368, p=.500; ϕ=.098, p=.500].

The specific Family Social Capital Questionnaire yielded continuous measures that have not been yet categorized. Thus, we here compare the mean and standard deviation values of the different constructs and dimensions. The average mark of the whole sample was 56.89±16.86, out of the 116 maximum possible mark. Comparing groups, the highest marks were obtained by the urban-medium and rural group (60.17±16.11; 59.67±17.28) in contrast to the urban-low and urban-high rural which got mean scores of 52.28±16.94 and 50.41±14.91), respectively. These differences were significant (F(3)=5.379, p=.001) and Post-hoc analysis using Tukey's HSD revealed three subsets that were statistically different for α=0.05. Subset 1 'urban-high & urban-low' was significantly different from subset 2 'urban-low & rural', which in turn were significantly different from subset 3 'rural & urban-medium'.

Differences between groups were greater in the cognitive scale than in the structural, and followed the same pattern as the overall mark, with the urban-medium and rural groups displaying higher scores, and statistically different from the other two groups (F(3)=4.457, p=.005). In fact, this pattern can be seen for all the subdimensions, except for *FSCQ_NormsTOTAL,* in which urban-high and urban-medium held the highest marks (4.57 and 4.87, respectively) and urban-low (3.94) was significantly below the rest (F(3)=21.13; p=0.45).

Greater dissimilarities occurred in the case of bridging social capital, where the mean marks for the whole sample was 26.58±12.32 and it ranged from 21.60±14.65 for the urban-low group to 29.06±11.54 in the urban-medium group. These differences were significant (F(3)=4.890, p=.003) and Post-hoc analysis using Tukey's HSD revealed three subsets whose scores were statistically different for α=0.05. Subset 1 'urban-high & urban-low' was significantly different from subset 2 'urban-low & rural', which in turn were significantly different from subset 3 'rural & urban-medium'.

It is interesting to note, too, that urban-high adolescents showed the highest negative social capital marks (-7.39±3.09) and that its mean value was significantly different from all the other groups (Welch's adjusted F ratio=8.110, p=.000). Also total household and outside the household FSC scores produced two subsets: urban high and urban low had the lowest scores in front of the highest scores for the urban-medium and rural groups. In both cases, differences were significant (F(3)=2.849, p=.038; Welch's adjusted F ratio=5.027, p=.003).

12.2. Correlational study

As a previous step to the development of logistic regression models, correlations between the dependent and independent variables were studied. Pearson correlation coefficient, Spearman Rank or chi squared comparisons were used, depending on the nature of the variables. Following Cohen's guidelines for interpreting effect sizes (J. Cohen, 1988), we considered correlations of $r,\rho \leq .30$ as a small effect size $.30 \geq r,\rho \geq .49$ as a moderate effect size and $r,\rho = .50 \geq$ as a large effect size. In our sample, all significant correlations were weak.

BMI did not show significant correlations with any of the sociodemographic or KIDMED variables. On the contrary, it did show a negative relationship with *SCFam* (*r*=.-189, p=.004), *FSCQ_NormsTOTAL* (*r*=.-167, p=.011), *FSCQ_NormsScreen*(*r*=.-204, p=.002) and *VT_RULT* (*r*=-.159, p=.022). This is, higher family social capital, social norms and RUTL scores (a higher score indicates a healthier use of IT), were associated with a lowest the tendency to suffer overweight. BMI was positively related with SRH (r=.132, p=.044), which, taking into account that for both scales lower marks mean healthier outcomes, indicates that lower BMI is associated to better self-rated health.

SRH was the dependent variable showing more associations with the rest of variables in our study. SRH was positively associated with *gender* (*r*=.172, p=.006), *K_Fruit1* (*r*=.162, p=.010), *VT_ PhysAct* (*r*=.203, p=.002), *FSCQ_TOTAL* (*r*=.209, p=.001), *FSCQ_COGNITIVE* (*r*=.241, p=.000), *FSCQ_ColEffTOTAL* (*r*=.179, p=.005), *FSCQ_InfContrTOTAL* (*r*=.207, p=.001), *FSCQ_BelongTOTAL* (*r*=.221, p=.001), *FSCQ_NegSSTOTAL* (*r*=.221, p=.001), *SCFam* (*r*=.239, p=.000), *SCSchool* (*r*=.135, p=.033) and *SESContext* (χ^2= 8.221, p=.042; ϕ=.108, p=.042). As mentioned above, SRH was also positively associated with BMI.

Table 16

Significant correlations of BMI and SRH with other lifestyle variables and with social capital and sociodemographic items.

	SRH	EdV	KIDMED	Social Capital	Sociodemographics
BMI	*SRH* (*r*=.132, p=.044)	*VT_RULT* (*r*=-.159, p=.022)	-	*SCFam* (*r*=.-189, p=.004). *FSCQ_NormsTOTAL (r*=.-167, p=.011) *FSCQ_NormsScreen*(*r*=.-204, p=.002)	-
SRH	*BMI* (*r*=.132, p=.044)	*VT_PA* (*r*=.203, p=.002),	*K_Fruit1* (*r*=.162, p=.010),	FSCQ_TOTAL (*r*=.209, p=.001) *FSCQ_COGNITIVE* (*r*=.241, p=.000) *FSCQ_ColEffTOTAL* (*r*=.179, p=.005) *FSCQ_InfContrTOTAL* (*r*=.207, p=.001) *FSCQ_BelongTOTAL* (*r*=.221, p=.001) *FSCQ_NegSSTOTAL* (*r*=.221, p=.001) *SCFam* (*r*=.239, p=.000) *SCSchool* (*r*=.135, p=.033)	*Gender* (*r*=.172, p=.006) *SESContext* (χ^2= 8.221, p=.042; ϕ=.108, p=.042)

Lifestyle total score correlated positively with *K_Fruit2 (r*=.142, p=.05)*, SCFam* (*r*=0,179, p=.014)*, FSCQ_TOTAL* (*r*=.202, p=.006), *FSCQ_COGNITIVE* (*r*=.189, p=.010) and its subscales *FSCQ_ColEffTOTAL* (*ρ*=.168, p=.021) and *FSCQ_BelongTOTAL* (*ρ*=.146, p=.046). No relevant correlations were found between lifestyle dimensions and gender (*r*=0.65, p=.370), highest parental education level (*r*=-0.90, p=.268), or parental origin (*r*=0.49, p=.508) using Pearson correlation nor with *SESContext* (χ^2= 6.423, p=.093) or family tipye (χ^2= 4.925, p=.553) using Chi-square test.

When turning to lifestyle subscales, *VT_PhysAct* showed a positive correlation with *FSCQ_TOTAL* (*ρ*=.189, p=.04) *FSCQ_STRUCTURAL* (*ρ*=.151, p=.21), its subscale *FSCQ_SocIntTOTAL* (*ρ*=.147, p=.025)*, FSCQ_COGNITIVE* (*ρ*=.184, p=.005) and all the subscales of the cognitive dimension of family social capital *FSCQ_ColEffTOTAL* (*ρ*=.164, p=.013), *FSCQ_InfContrTOTAL* (*ρ*=.135, p=.04) and *FSCQ_BelongTOTAL* (*ρ*=.168, p=.011). With regard to the sociodemographic variables, a positive association was only found in the case of gender (*r*=.264, p=.000), indicating that boys tend to have a more active lifestyle.

VT_RULT correlated positively with *FCSQ_TOTAL* (*ρ*=.245, p=.000), structural social capital subscales *FSCQ_SocIntTOTAL* (*ρ*=.147, p=.025) and *FSCQ_NormsTOTAL* (*ρ*=.165, p=.013). Data did not show a significant correlation between *VT_RULT* and overall structural social capital, *FSCQ_STRUCTURAL*. Positive correlations were also observed with regard to *FSCQ_COGNITIVE* (*ρ*=.222, p=.001) and the following subscales of the cognitive dimension of family social capital *FSCQ_ColEffTOTAL* (*ρ*=.170,

p=.011), *FSCQ_InfContrTOTAL* (*ρ*=.156 p=.020)*, FSCQ_BelongTOTAL* (*ρ*=.220, p=.001) and *FSCQ_NegSSTotal* (*ρ*=.134, p=.045). It is important to take into account that *FSCQ_NegSSTOTAL* is an inversed scale, so this results indicate that a higher score in *FSCQ_NegSSTOTAL,* which means lower negative social capital and conflict, is associated with a higher score in *VT_RULT,* inidicating a healthier use of IT in leisure time in these adolescents that perceive less conflict in their families. Again, a better use of technological leisure time was associated with being male (*r*=.175, p=.008).

Table 17

Significant correlations of the VISA-TEEN questionnaire with social capital and sociodemographic items.

	Social Capital	**Sociodemographics**
VT_TOTAL	*SCFam* (*r*=.179, p=.014)*,* *FSCQ_TOTAL* (*r*=.202, p=.006) *FSCQ_COGNITIVE* (*r*=.189, p=.010) *FSCQ_ColEffTOTAL* (*ρ*=.168, p=.021) *FSCQ_BelongTOTAL* (*ρ*=.146, p=.046)	-
VT_PhysAct	*FSCQ_TOTAL* (*ρ*=.189, p=.04) *FSCQ_STRUTURAL* (*ρ*=.151, p=.21) *FSCQ_SocIntTOTAL* (*ρ*=.147, p=.025) *FSCQ_COGNITIVE* (*ρ*=.184, p=.005) *FSCQ_ColEffTOTAL* (*ρ*=.164, p=.013) *FSCQ_InfContrTOTAL* (*ρ*=.135, p=.04) *FSCQ_BelongTOTAL* (*ρ*=.168, p=.011)	*Gender* (r=.264, p=.000)
VT_Nutrition		*SESContext* (F(3)=4.301, p=.007)
VT_RUTL	*FCSQ_TOTAL* (*ρ*=.245, p=.000) *FSCQ_SocIntTOTAL* (*ρ*=.147, p=.025) *FSCQ_NormsTOTAL* (*ρ*=.165, p=.013) *FSCQ_COGNITIVE* (*ρ*=.222, p=.001) *FSCQ_ColEffTOTAL* (*ρ*=.170, p=.011) *FSCQ_InfContrTOTAL* (*ρ*=.156 p=.020) *FSCQ_BelongTOTAL* (*ρ*=.220, p=.001) *FSCQ_NegSSTOTAL* (*ρ*=.134, p=.045)	*Gender* (*r*=.175, p=.008)
VT_ToxHab	*FCSQ_TOTAL* (*ρ*=.203, p=.002) *FSCQ_NormsTOTAL* (*ρ*=.181, p=.005) *FSCQ_COGNITIVE* (*ρ*=.181, p=.005) *FSCQ_ColEffTOTAL* (*ρ*=.183, p=.005) *FSCQ_InfContrTOTAL* (*ρ*=.162 p=.012) *FSCQ_BelongTOTAL* (*ρ*=.196, p=.003) *FSCQ_NegSSTOTAL* (*ρ*=.247, p=.000)	*SES_context (F(3)=12.480, p=.000)*
VT_Hygiene		*Gender* (*r*=-.231, p=.000)

VT_ToxicHab correlated positively with *FCSQ_TOTAL* (*ρ*=.203, p=.002), structural social capital subscale *FSCQ_NormsTOTAL* (*ρ*=.181, p=.005). Data did not show a significant correlation between *VT_ToxicHab* and overall structural social capital, *FSCQ_STRUCTURAL*, nor its subscale *FSCQ_SocIntTOTAL.* Positive correlations were also observed with regard to *FSCQ_COGNITIVE* (*ρ*=.181, p=.005) and all the subscales of the cognitive dimension of family social capital

FSCQ_ColEffTOTAL (*ρ*=.183, p=.005), *FSCQ_InfContrTOTAL* (*ρ*=.162 p=.012), *FSCQ_BelongTOTAL* (*ρ*=.196, p=.003) and *FSCQ_NegSSTOTAL*(*ρ*=.247, p=.000).

No significant correlations were found between *VT_Nutrition* or *VT_Hygiene* and indicators of social capital. With regard to the sociodemographic variables, and as described above, *VT_Nutrition* scores varied significantly based on *SESContext* (F(3)=4.301, p=.007). *VT_Hygiene*, in turn, was negatively correlated with gender, indicating that girls had better scores in this variable.

KIDMED total score only showed a weak negative relationship with gender (*r*=-.125, p=.044), indicating that female adolescents tend to have higher scores than male, while no significant correlations were found with the other sociodemographic or social capital variables.

Turning to the subitems of the KIDMED scale, eating one piece of fruit daily was correlated to *FSCQ_InfContrTOTAL*(r=.126, p=0.47), *FSCQ_BelongTOTAL*(r=.135, p=.035) and *FSCQ_COGNITIVE* (r=.127, p=0.47). Family type also showed a modest association with this variable (χ^2= 13.195, p=.040; ϕ=.228, p=.040). Consuming 2 pieces of fruit per day, in turn, was associated with *FSCQ_SocIntTOTAL*(r=.146, p=0.24), *FSCQ_ColEffTOTAL*(r=.133, p=0.37), *FSCQ_STRUCTURAL* (r=.156, p=.015), *FSCQ_COGNITIVE* (r=.129, p=0.44), *FSCQ_HH* (r=.173, p=.007), *FSC_TOTAL* (r=.180, p=.005) and *FSCQ_NormsTobacco*(r=.135, p=0.34).

Eating one serving of vegetables per day was associated to *FSCQ_BelongTOTAL*(r=.161, p=.012), *FSCQ_COGNITIVE* (r=.136, p=0.34), *FSCQ_HH* (r=.219, p=.001), *FSC_TOTAL* (r=.136, p=.035). The intake of a 2nd serving of vegetables showed no association with any of the sociodemographic or social capital variables.

The intake of fish two or three times per week was associated with household education (r=.129, p=.042). Fast food consumption more than once a week, appeared to be correlated with *FSCQ_HH* (r=-134, p=037), SESContext (χ^2= 15.719, p=.001; ϕ=.247, p=.001). SESContext was also associated to the intake of pulses at least twice per week (χ^2= 9.323, p=.025; ϕ=.190, p=.025), which also was correlated to Family type (χ^2= 24.424, p=.000; ϕ=.311, p=.000). *Pasta and rice* intake was associated with *gender*, being high among boys than girls (r=.232, p=.000).

As a source as healthy fatty acids, the intake of nuts at least twice a week was correlated with *FSCQ_SocIntTOTAL*(r=.229, p=000); *FSCQ_STRUCTURAL* (r=.232, p=.000), *FSCQ_HH* (r.183, p=.004) and *FSCQ_TOTAL* (r=.178, p=.006). Olive oil, in turn, was associated with parental education level (r=.151, p=017) and *SEScontext* (χ^2= 22.549, p=.000; ϕ=.296, p=.000).

Breakfast-related variables showed the biggest number of correlations with both sociodemographic and social capital variables. The fact of eating a cereal product for breakfast was associated with *FSCQ_NormsTOTAL* (r=.133, p=0.37), *FSCQ_BelongTOTAL*(r=.132, p=.040), *FSCQ_HH* (r=.182, p=.004), *FSCQ_NormsBed* (r=.146, p=.021), *FSCQ_NormsScreen* (r=.146, p=.020) and *SEScontext* (χ^2= 9.119, p=.028; ϕ=.188, p=.028).

No eating breakfast was more common among those with low household education level (r=-.131, p=.038) and lower scores on *FSCQ_SocIntTOTAL*(r=-.146, p=.021), *FSCQ_ColEffTOTAL*(r=-.169, p=.008), *FSCQ_BelongTOTAL*(r=-.169, p=.008), *FSCQ_COGNITIVE* (r=-.182, p=.004), *FSCQ_HH* (r=-.246, p=.000), FSC_TOTAL (r=-.199, p=.002), S*CFam* (r=-.200, p=.002), *FSCQ_NormsBed* (r=-.149, p=.018), *FSCQ_NormsTobacco* (r=.140, p=.027) It was also correlated with *Family type* (χ^2= 22.088 p=.001; ϕ=.295, p=.001) and *SEScontext* (χ^2= 23.333, p=.000; ϕ=.301, p=.000). SESContext was associated with eating pastry for breakfast (χ^2= 8.172, p=.043; ϕ=.178, p=.043), too.

Having a dairy product for breakfast was associated with gender (r=.223, p=.000 – girls ate dairy more frequently than boys), *FSCQ_HH* (r=.134, p=036) and *FSCTOTAL* (r=.135, p=.037). With regard to the consumption of 2 daily portions of yogurt or cheese, SCSchool (r=.192, p=.002) and parental origin (r=.151, p=.030) showed to be correlated.

Last, daily intake of candies was more frequent among those with lower marks in *FSCQ_NormsTOTAL* (r=-.175, p=.006), *FSCQ_NormsTobacco* (r=-.262, p=.000). There were also significant differences based on the *SESContext* (χ^2= 16.962, p=.043; ϕ=.256, p=.001).

Table 18

Significant correlations of the KIDMED scale with social capital and sociodemographic items.

	Social Capital	Sociodemographics
KIDMED_TOTAL		Gender (r=-.125, p=.044)
Fruit1	FSCQ_*cognitive_SC* (r=.127, p=0.47). *FSCQ_total_informal_control* (r=.126, p=0.47), *FSCQ_BelongTOTAL*(r=.135, p=.035)	Family type (χ^2= 13.195, p=.040; ϕ=.228, p=.040)
Fruit2	*FSC_TOTAL* (r=.180, p=.005) *FSCQ_STRUCTURAL* (r=.156, p=.015) *FSCQ_SocIntTOTAL* (r=.146, p=0.24) *FSCQ_NormsTobacco*(r=.135, p=0.34) *FSCQ_COGNITIVE* (r=.129, p=0.44) *FSCQ_ColEffTOTAL*(r=.133, p=0.37) *FSCQ_HH* (r=.173, p=.007)	
Vegetabl1	*FSC_TOTAL* (r=.136, p=.035) *FSCQ_COGNITIVE* (r=.136, p=0.34) *FSCQ_BelongTOTAL*(r=.161, p=.012) *FSCQ_HH* (r=.219, p=.001)	
Vegetabl2		
Fish		*HighEducHousehold* (r=.129, p=.042)
FastFood	*FSCQ_HH* (r=-134, p=037),	*SES context* (χ^2= 15.719, p=.001; ϕ=.247, p=.001)
Pulses		*SESContext* (χ^2= 9.323, p=.025; ϕ=.190, p=.025) *Family type* (χ^2= 24.424, p=.000; ϕ=.311, p=.000)
PastaRice		*Gender* being (r=.232, p=.000)
BreakfCereal	*FSCQ_NormsTOTAL* (r=.133, p=0.37) *FSCQ_NormsBed* (r=.146, p=.021) *FSCQ_NormsScreen* (r=.146, p=.020) *FSCQ_BelongTOTAL*(r=.132, p=.040) *FSCQ_HH* (r=.182, p=.004),	*SEScontext* (χ^2= 9.119, p=.028; ϕ=.188, p=.028).
Nuts	*FSCQ_TOTAL* (r=.178, p=.006) *FSCQ_STRUCTURAL* (r=.232, p=.000) *FSCQ_SocIntTOTAL*(r=.229, p=000) *FSCQ_HH* (r.183, p=.004)	
OliveOil		*HighEducHousehold* (r=.151, p=017) *SEScontext* (χ^2= 22.549, p=.000; ϕ=.296, p=.000).
NoBreakfast	*FSCQ_SocIntTOTAL*(r=-.146, p=.021) *FSCQ_NormsBed* (r=-.149, p=.018) *FSCQ_NormsTobacco* (r=.140, p=.027) *FSCQ_COGNITIVE* (r=-.182, p=.004) *FSCQ_ColEffTOTAL*(r=-.169, p=.008) *FSCQ_BelongTOTAL*(r=-.169, p=.008) *FSCQ_HH* (r=-.246, p=.000), FSC_TOTAL (r=-.199, p=.002) S*CFam* (r=-.200, p=.002)	*Family type* (χ^2= 22.088 p=.001; ϕ=.295, p=.001) *SEScontext* (χ^2= 23.333, p=.000; ϕ=.301, p=.000).
BreakfDairy	*FSCTOTAL* (r=.135, p=.037) *FSCQ_HH* (r=.134, p=036)	*Gender* (r=.223, p=.000)
BreakPastry		*SESContext* (χ^2= 8.172, p=.043; ϕ=.178, p=.043),
YogCheese	*SCSchool* (r=.192, p=.002)	*ParentsAutoc* (r=.151, p=.030)
Candies	*FSCQ_NormsTOTAL* (r=-.175, p=.006) *FSCQ_NormsTobacco* (r=-.262, p=.000).	*SESContext* (χ^2= 16.962, p=.043; ϕ=.256, p=.001).

12.3. Logistic Regressions

As described in the previous section, we used a forward stepwise selection method using the Wald statistic. Accordingly, for each of the dependent variables, we started by model 0 which contained only the constant, and then, in every step, the independent variable most likely to influence the model was added. This procedure was repeated until none improved the model.

To assess the accuracy of the models, the recommendation of testing the best fit model in a new set of data not used to create the model was followed by building the model with the 60% of the sample, and then using the remaining 40% to assess the accuracy of the model. Finally, the model was tested again using the whole data set. Only when the two tests were passed the models were validated.

In our study, we tried to develop logistic regression models for the following dependent variables: *SRH, BMI, VT_TOTAL, KIDMED, and VT_Nutrition*. After several attempts, only models for *SRH*, and *BMI* were feasible. The fact that models for the other dependent variables have not been possible to be developed needs to be interpreted as a lack of explanatory power from our independent variables. This, in our sample, nor VISA-TEEN nor KIDMED scores are a product of the interplay of independent variables such as SES context, gender, or the different dimensions of social capital.

12.3.1. Self-rated Health

For the self-rated health model, the dependent variable was whether the adolescent perceived its health as good (SRH=1) or poor (SRH=0), so we were interested in the factors that influenced this perception. The outcome is binary (yes or no) and the predictor variables were those selected based on their risk or protective factors according to the literature and to the bivariate analysis conducted previously. Self-rated health was correlated with *SESContext, gender, BMIDichot, K_fruit1, VT_PhysAct, VT_ToxicHab, FSCQ_TOTAL, FSCQ_COGNITIVE, FSCQ_ColEffTOTAL FSCQ_InfContrTOTAL, FSCQ_BelongTOTAL*, *FSCQ_NegSSTOTAL, SCFam, SCSchool*. Because of the relevance in previous studies we also added parental educational level as a control variable.

As a previous step, we run a multicomponent factorial analysis in which all independent the variables, except for *BMI* and *FSCQ_NegSSTOTAL,* which had an inverse scale, where introduced in the model. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .656, indicating

an adequate adjustment to the principal components model. Barlett's test of sphericity (p<.0001) confirmed the correlation matrix is not sphere-shaped, endorsing the adequacy of continuing with the factorial analysis. The Exploratory Factorial Analysis using a VARIMAX rotation method produced three factors that explained 71,326% of the total variance. Table 19 shows the factor loading for every variable, indicating the existence of three factors, which are consistent with the three instruments used. The first factor, which explains the biggest part of variance of SRH (36.353%), is a family social capital factor that includes *FSCQ_ColEffTOTAL, FSCQ_InfContrTOTAL* and *FSCQ_BelongTOTAL*. The second factor accounts for 18.137% of the variance is a lifestyle factor including *VT_PhysAct* and *VT_Nutrition.* The last factor only includes the total score of the *KIDMED* scale and accounts for 16.836% of the variance.

Table 19

Rotated Component Matrix. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

	Component		
	1	**2**	**3**
FSCQ_ColEffTOTAL	.893		
FSCQ_InfContrTOTAL	.797		
FSCQ_BelongTOTAL	.795		
VT_PhysAct		.864	
VT_Nutrition		.589	
KIDMED_Total			.926

After conducting this analysis, one can chose whether to use factor's scores or the most representative variable of each factor. While using factor scores allows to keep more information, the results of regressions built based on this method are less able to be extrapolated to the population because they depend too much on the characteristics of the sample. On the other hand, selecting the most representative variable entails losing some information, but permits to identify general trends of the population. The fact that our sampling strategy is not random, makes generalization not possible. However, we opted for developing a model for both options, with the intention to assess how they behave. With the aim of facilitating the interpretation of the models, factor scores are converted to 1-4 values by dividing the sample in quartiles.

Table 20 shows the results for the different models of logistic regression to explain SRH.

Model 0. Constant-only model

Model 0, the constant-only model, allowed to classify correctly 57% of the cases. In other words, using as a predictor the largest group of the variable SRH (1=good SRH), 57% of the cases were correctly classified (p≤.05).

Model 1A. Forward stepwise logistic regression using factor scores

Step 1 of model 1 added the variable *BMIDichot,* step 2 introduced the *family social capital factor (FSCQ_Factor)* and step 3 included *gender*. This model stopped here and can explain between 11.4% and 15.6% of the total variance of SRH, which is a very low predictive capacity, but it allows to study how the independent variables influence self-rated health in our sample.

Goodness-of-fit was evaluated through the omnibus tests of model coefficient and Hosmer & Lemeshow test. Omibus test p<0.05 indicate whether the inclusion of the independent variables improves the dependent variable prediction significantly. The Hosmer & Lemeshow test, in turn, reflects whether the results predicted by the model are significantly different from the observed ones. Sig > 0.05 indicates that differences between the two models are not significant.

According to this model, gender is the most important predictor of self-rated health among our independent variables, with odds of perceiving good SRH being 2.3 times higher for men than women. Adolescents with higher levels of family social capital (as measured by the factor created in the previous step), were 50.6% more likely to manifest good SRH, when compared to adolescents with lower levels of family social capital. The third variable in our model is BMI. Being overweight or obese increases the chances to have poor SRH by 78%.

The model was validated with both, the remaining 40% and the 100% of the sample, by obtaining coefficients within the confidence interval of the model created with the 60% of the sample.

Model 1B. Forward stepwise logistic regression using principal variables

As in the previous case, we began working with 60% of the cases to adjust the model. The most representative variables of each factor were *FSCQ_ColEffTOTAL, EdV_Nutrition* and *KIDMEDTotal.* We additionally added *BMIDichot, gender, SESContext* and *HighEducHousehold.*

A model was established with three variables: *FSCQ_ColEffTOTAL BMIDichot* and *gender*. This model was very similar to the previous one using factor scores, which indicated good coherence between models. Goodness-of-fit measures also corroborated this.

In this model, the effect size of gender and BMI was slightly higher than the previous one (OR 2.456; OR 0.245, respectively), while family social capital, as measured through *FSCQ_ColEffTOTAL,* exerted a smaller influence (OR 1.129).

The model was validated by applying it to the remaining 40% of the sample and, finally, 100%, confirming its adequacy.

Model 2. Logistic regression using principal variables, controlling for *SESContext* and *SCSchool*

Because SES and social capital in other domains have been described as important social determinants of health, we decided to use the method *enter* to fit *SESContext* and *SCSchool* (*SCNeigh* did not appear to be related to SRH in the bivariate analysis) in order to assess possible changes in the influence of the other independent variables. *SCSchool* is a dichotomous variable (0=low; 1=high), while *SESContext* distinguishes the four groups of our sample. Here, we created 3 dummy variables, taking urban-low context as a reference.

When both variables were introduced in model 1B (we selected this one over 1A because of its higher R2), *FSCQ_ColEffTOTAL BMIDichot* and *gender* Exp(B) minimally varied, but the inclusion of the new variables did not modify the interpretation of the model, whose Exp(B) still fell within the CI of models 1A and 1B.

Table 20

Logistic regression results for SRH

	Model 0		**Model 1A**		**Model 1B**		**Model 2**	
	Exp(B)	**Wald**	**Exp(B)**	**Wald**	**Exp(B)**	**Wald**	**Exp(B)**	**Wald**
Constant			.405(.075)	3.167	.205 (.017)	5.712	.560(.014)	6.013
Gender			2.320(.034)	4.510	2.456 (.020)	5.411	2.179(.047)	3.938
Family social capital*			1.506(.024)	5.067	1.129 (.009)	6.894	1.128(.011)	6.502
BMIDichot			.224(.011)	6.496	.245 (.012)	6.254	.259(.019)	5.543
SCSchool							1.437(.707)	.148
SESContext							(.141)	5.466
SESContext1							2.185(.237)	1.396
SESContext2							3.412(.078)	3.098
SESContext3							4.222(.033)	4.542
Model χ^2 [df]			14.935 [3] (.002)		17.043 [8] (.001)		23.227 [7] (.002)	
Block χ^2 [df]			14.935 [3] (.002)		17.043 [8] (.001)		23.227 [7] (.002)	
Hosmer-Lemeshow	7.395(.495)		8.349 (.400)		8.551 (.382)		5.170 (.739)	
Cox & Snell R^2	.099		.114		.122		.154	
Nagelkerke R^2	.133		.153		.163		.206	
Predictive capacity (%)	9.9-13.3%		11.4-15.3%		12.2-16.3%		15.4-16.3%	
Correct predictions (%)	57%		65%		66.4%		65.5%	

*Note: *Family social capital introduced through factor scores or principal variable.*

12.3.2. Body Mass Index

The development of a logistic regression model for BMI using forward stepwise Wald selection produce a model in which only SRH was included and the predictive capacity very low. As a response, we used the enter method to produce a model in which *self-rated health, gender* and *SCFam* explained between 12.1% and 20.8% of the variance of BMI. BMI was used in its dichotomous form, according to which BMI=0 indicated normoweight and BMI=1 overweight or obesity. Table 21 presents the main statistics of the model.

Table 21

Logistic regression results for BMI

	Exp(B)	**Wald**
Constant	.495 (.303)	1.061
Gender	4.676 (.022)	5.237
SCFam	.240 (.061)	3.502
Self-Rated Health	.185 (.006)	7.624
Model χ^2 [df]	14.739 [3] (.002)	
Block χ^2 [df]	14.739 [3] (.002)	
Hosmer-Lemeshow test	.987 (.912)	
Cox & Snell R^2	.121	
Nagelkerke R^2	.208	
Predictive capacity (%)	12.1-20.8%	
Correct predictions (%)	83,3%	

Here again *gender* was the stronger predictor of BMI. In our sample, being male (gender = 1) increases the chances of being overweight or obese by 367.6%. In other words, men were 4.7 times more likely to be overweight or obese than women. *SRH* was the second more influent variable on BMI: adolescents reporting good self-rate health (SRH = 1), had 81.5% less probability to be overweight or obese. The last variable included in the model was *SCFam*. As noticeable in table 11, *SCFam* was not statistically significant (p=.061), but because it was close to the limit and social capital is an important variable in our study we decided to include it and to interpret it as a tendency. OR = 0.240 indicated that high levels of family social capital diminished the likelihood of being overweight or obese by 76%.

Last, even though the model was able to predict 83% of the cases correctly, the fact that the distribution of normoweight and overweight/obesity adolescents is so uneven (84,5% vs 15.5% respectively) limits the explanatory capability of this model. Step 0 (constant-only model) predicted correctly 84,1% of the cases, which means that, in our sample, it is more likely to make a correct guess by saying that all the adolescents are normoweight than by applying this model.

Nevertheless, the development of the model allows to assess how the different independent variables behave in relation to the dependent variable and to stablish and hypothesis of how they influence BMI. It is also probably due to this uneven distribution of BMI that it was not possible to develop a model using forward stepwise selection logistic regression.

13. Results of the multiple cases study

In this section we present the results of the 33 case studies conducted through interviews and the application of several questionnaires with the aim of gaining an in-depth understanding of the role of social capital in relation to lifestyle, eating habits and weight status in adolescents from different socioeconomic contexts. Results of the quantitative study, contrary to most of the scientific literature, indicated that in our sample SES did not influence significantly the probability of reporting good or poor self-rated health, of being overweight or lifestyle scores, and that, in contrast, different dimensions of social capital (especially of family social capital) might have a greater effect. In this multiple cases study, we aim to further comprehend and contextualize the previous results.

In the following pages we report the results of the questionnaires and the interviews conducted in the 33 case studies. The quotes presented here are a translation of the original interviews, which were held in Spanish or Catalan. As the reader will notice, in many cases the adolescents' responses to the interview questions were short and straight, which can be interpreted as an absence of or as a scarce awareness, reflection or metacognition of some of the topics we were investigating. As shown in the methodology section, interviews began by asking the participants to describe the place they lived in, their families, schools and groups of friends, and continued by talking about health, lifestyle and diet in a second part. In this section, we present first an overview of our participants' social context in the different domains. Next, we report the results of the different lifestyle and diet-related questionnaires, contrast them with the adolescents' interviews and explore their relation with different dimensions of social capital in the different domains.

13.1. Social context of the participants

13.1.1. Community context

After welcoming the participants, introducing them to the study, and having them fill out the questionnaires, the interviews were initiated, asking the participants to describe the place they lived in. This question allowed a smooth beginning of the interview, without focusing too much on personal issues. At the same time that was the entrance to explore community social capital.

As expected, there were differences on how rural and urban adolescents perceived their social environment. For starters, rural context adolescents generally demonstrated knowledge of everyone in their town, while that was not the case in the urban areas. In fact, this difference was particularly evident when looking at the meaning that the word 'neighbors' had for each of them in response to the question *'do neighbors know each other?'.* While most rural adolescents thought of neighbors in terms of inhabitants of the same village or neighborhood, urban participants talked about neighbors in terms of people living in the same building.

Some exceptions happened in the case of urban adolescents whose parents and grandparents had always resided in the neighborhood, which manifested to stop and talk to the neighbors when they run into each other at the street (C013, female, G5; L'H008, female, G7; C030, female, G5), as well as the opposite was true for rural adolescents that just moved to a different village (P215, female, G1).

In this sense, responses from all the groups were more homogenous when asked *'do neighbors get along with each other?':*

> *'Yes,* more *or less [we know each other]. We have a very good relationship with our next door neighbors'* (B002, male, G5).
>
> *'I believe that neighbors in* Poble Nou *are quite kind. They always say hi to my grandmother. She has always lived there and every three meters she finds somebody that greets her (…). People don't only look out for themselves, you ask how their kids or relatives are doing…. People know each other'* (C013, female, G5).
>
> *'Yes, I think people generally do (know each other). People like my grandmother, who has been living here for a long time, know each other and they will help each other no matter what. They always say hi, they stop to talk to each other in the street… some of the people that have just arrived say hi, but there are others that don't even look at me when I walk by their side'* (L'H008, female, G7).
>
> *'The relationship among neighbors is very good, because it is a long-time relationship, between parents and grandparents. It is a very close relationship'* (P209, male, G2).
>
> *'I live in the* Eixample, *close to* Plaça Catalunya. *It is not a neighborhood with their own festivity or where they do a paella. It is a neighborhood crowded with offices and hostels, there are a lot of foreigners and tourists'* (C010, male, G5).

Apart from the time of residency in the town or neighborhood, experiences with other neighbors have an important influence ion how adolescents see the places they live in and whether they feel happy living there. While authors like Morrow (1999) might consider this as a part of social capital, we agree with (Harpham, 2010) that views of the environment act as an intermediate variable between social capital and health. Thus, perceiving a town or neighborhood as a good place to live may influence the use that adolescents do of the social capital available. In this sense, in all the groups there were adolescents that felt good living in their towns/neighborhoods and adolescents that did not, although their reasons were not the same. For example, perceived insecurity is only mentioned by urban participants (B004, male, G6; L'H028, feme, G7), whereas boredom, mistrust or too much gossip were exclusively referred to by rural adolescents (P006, male, G4; P010, female, G2; P027, female, G3; P055, female, G2; P253, female, G4). It is interesting to note that none of the adolescents in the most privileged groups (G1, G5) had negative perceptions about their location.

Another point of interest of our study with regard to adolescents' social capital was **social participation and social networking** in their communities. This participation could take different forms: local associations, preparation of events, informal relationship of adolescents with other adults in their communities, etc. Generally speaking, it can be said that adolescents did not have a very active role in their communities due, on the one hand, to lack of structures and opportunities to do so, and, on the other, to a certain disinterest of the adolescents themselves in being involved in their communities.

> *'[In my neighborhood] there are things and activities for the youth, but I am always with my friends. We meet up, go to the beach… I don't know'* (B002, male, G5).

> *'[In my neighborhood] there are no activities for the youth, at least that I know of. Anyway, I don't socialize much in my neighborhood. My itinerary is from school to home'* (C010, male, G5).

> *'Sometimes we receive leaflets from the youth center, announcing different activities, but I have never participated'* (P200, male, G4).

Some of the participants, however, had quite a strong bond with their communities, mostly from participating in civic associations or activities promoted by the city council of rural areas or small urban neighborhoods, mainly in the context of festivities. In general, it was more common about medium-low groups.

'I do some community things outside the school, but that have been promoted by my school. For example, I participate in the Generalitat Council of l'Hospitalet[7] *and I am also a mediator. I really like it. We are at the service of the community and do a lot of things to help others and our neighborhood. We try to give things another point of view, because this neighborhood is supposed to be on the bad side of l'Hospitalet and we try to clean its image'* (L'H008, female, G7).

'I participate in La colla gegantera *of Puigcerdà (…). Apart from this friend of mine, I go there with my mom and some acquaintances that I didn't know before, and now we're more like friends. People that I didn't know are my friends'* (P007, female, G4).

'Yes. In a few weeks there will be our local festivity and there are things for everyone, for children, for youth, for the elderly… there are also popular walks… We participate and decide because there are like 'blocks of activities' and then we can organize ourselves' (B018, female, G7).

'I belong to an Esplai *and we go on excursions, meet with other groups… we vote and then depending on the budget that we have, we decide'* (B002, male, G5).

'For example, there are concerts for The Youth Night *during* La Festa del Llac*, and it's cool, because everyone in town is there, and people talk…. Or other activities such as Zumba, in which I want to enroll with my mom, because even if there are a lot of young people there, the two of us like dancing and since you are there you will talk to people and interact with them (…). These activities are not only taking youth or adults into account, they are organized for both, and no one needs to make sacrifices'* (P245, female, G3).

Lack of economic resources, as well the profile of users of some public services, were perceived as a limitation to participate in social activities.

'I like dancing, and I would do more things, but because there isn't much money I can't do a lot of things. But I would like to do more. Every time that I have the chance, I go places where there are activities' (L'H008, female, G7).

'There [at the youth center], you normally find a kind of people that I don't think is the right one, and if you go there you will end up going their way and that's what I

[7] Consell de la Generalitat a l'Hospitalet.

don't like. There you find 'dodgy' people, and I get along with them, I mean, I greet them, but I don't want to be with them so much' (P006, male, G4).

No reference was made on how social capital at the community level could influence lifestyle or dietary habits in our sample.

13.1.2. Family context

After exploring the community domain, participants were asked to talk about their families. Questions used to address this topic were *'So, now tell me about your family. How is it?', 'How do you feel towards them?'* or *'What kind of things do you do with them?'.* Participants were also invited to talk about their extended families when this did not come up spontaneously during the conversation.

Apart from a mere description of the family structure (which we already knew from the selection questionnaires), our interest lied in the relationships between the different family members and these aspects that can be considered as a part of social capital, such as **social interaction**, **sense of belonging, social cohesion, shared norms and values, informal control and autonomy, social support and bridging social capital.** How these affected lifestyle or dietary habits is discussed in the following sections.

When looking at **social interaction** we aimed to understand how adolescents in the different groups related to other actors in the community, family, school and peer domains. With regard to family, two points captured our attention: whether family structure had a significant impact on social interaction, and the role that proximity or distance had on relationships, especially with the extended family. Additionally, we were interested in seeing how social interaction influenced other dimensions of social capital such as sense of belonging, social cohesion, shared norms and values, informal control and autonomy or social support.

The way in which adolescents interacted with their members of their family did not necessarily vary based on household family structure nor SES. Almost all the participants referred to talking to their parents, siblings, step-parents doing errands, taking a walk, watching TV or having meals together. As it may be expected, though, dissimilarities appeared when looking at feelings of **confidence and closeness** among family members and the extent of things that adolescents shared with their families, which, in turn, seemed to be related to the quantity and quality **of**

social interaction between family members, and perceptions of **family cohesion** and **sense of belonging.**

Interestingly, too, there were important gender differences in how participants reported their relationships with their family and the meaning and relevance that it has for them. In general, girls appear to be more reflective and concerned about their family relationships. On the one hand, it could be due to the different cultural roles of males and females. A second explanation would be the fact that the degree of maturation (girls tend to mature earlier than boys) also influences reflection about all these questions.

> *'I live with my parents. When I was a kid I used to live with my mother's parents, both of whom are still alive; and I don't have a lot of memories of my parents from my childhood. When I remember that time, I normally think more of my grandparents, except for travelling. My relationship with my parents is good, but I don't feel very confident with them, because they are never at home. I don't know… If I had to explain something to them, I would just not do it. I don't feel very confident with them. Maybe they have confidence in me, but I have never felt confident with them. If I had to explain something to my mom I could not go and tell her. I mean, I could, but I don't want to. I would like to do it, but I don't do it and it makes me angry'* (C013, female, G5).
>
> *'My family is not conventional at all. We trust each other a lot. I am the youngest of three daughters –the oldest one is six years older than me. My parents got married very young and all of us were born before my mom was thirty. So, the relationship between us is not like the one most people have with their parents. With my parents, I have talked about things that are not very normal….'* (C030, female, G5).
>
> *'My mom's family is a* pack *very difficult to enter. Sometimes they invite my father's dad, and he says that he does not feel part of it, in spite of all the good relationships he sees. My mom has four siblings and they are very united'* (C030, female, G5).
>
> *'I get along better with my mom than with my dad. Because with my mom I can talk about many things that with my dad I can't. With him I only speak about school and English'* (L'H023, female, G8).
>
> *'My relationship with my parents has always been good, although I somehow worsen it, because I explain everything to my best friends and not to them, because I don't*

feel like… because if something is worrying me, I prefer to tell it to my best friend. Although if they found out, they would feel sorry. As for my brother [older brother], *I could tell him things, but I don't because I am afraid that he'll think bad things of me. I am kind of afraid. But my brother is very loving with me and now we feel closer and we tell each other more things'* (B018, female, G7).

'I trust my dad more than my mom. I can explain more secret things to my dad, because I know that he won't tell anyone. However, my mom will probably tell my grandmother or something like that. With her I talk more about girl things, like periods and so on' (B014, female, G8).

'In my family, we have a certain degree of confidence, but I don't tell them the same things that I tell to my friends' (P006, male, G4).

'I feel very confident with my mother's partner. I would say that sometimes I trust him more than my mom, but that's because I spend more time with him. I also trust my dad, though!' (P215, female, G1).

'I feel good with my family. When my oldest bother left [to study in Barcelona], I felt a little bit alone, because I got along very well with him, but know I have gotten used to it, and somehow all the other family members [parents and younger brother] have become closer. Now, if I have a problem I reach to them, while I didn't do it before' (P025, female, G1).

'In my family we are very…. We always share everything and there are no taboos. And when I say that to my friends they kind of get upset, like it was not normal to talk about sex or everything with parents' (P055, female, G2).

'My family is… in two words… different to me. Because they all seem like clones. I have realized that my brother [older], all the thoughts he has, are my dad's or mom's. I do have some things in common with them. For example, I like sci-fi, but when it turns to the kind of activities that we prefer or our opinions on politics or the world… we are different' (P245, female, G2).

'My relationship with my family is good, we trust each other. If I had a problem I guess I could talk to them, although I normally don't do it' (P200, male, G4).

> *'The relationship with my parents is good, now it's worse than it used to be. They always worry too much about me, and I rather manage things on my own. Sometimes I get upset about it. The relationship is not bad, but we always have little fights because sometimes they call me and I don't pick up the phone…'* (P241, male, G3).

Although we could see no pattern between the frequency of talking with the extended family living in other regions and the feelings of closeness with them, the development of other activities with the extended family and the frequency of social interaction with them necessarily differed depending on proximity. Along the same lines, distance did seem to condition the influence that extended family members, particularly grandmothers, had of dietary and other lifestyle habits. For example, these participants living with or with very frequent contact with their grandmothers named them as an influential person in their dietary habits, while all the others did not.

> *'We have a good relationship with my grandparents [who we live with], but my grandmother would sit me at the table and make me eat until I finish everything. Her portions are three-fold normal sizes. Food is very important to her'* (P254, female, G4).

> *'I have learnt how to eat well at home. My grandparents have always given me advice'* (P200, male, G4).

> 'I have learnt how to eat well at my grandmother's, from what I have seen. It doesn't mean that we necessarily like the same things, though, because for example, they love stews and I don't like them' (L'H008, female, G7).

In the family domain, most of the non-health related norms and values adolescents referred to were related to going out, curfew hours, school-related topics or time-management at home. With few exceptions, adolescents in our sample felt that they had a fair degree of autonomy with regard to their parents.

> *'I normally live with my mom and when we [my brother and I] go to our dad's it is like were freer, because we do what we want to, we sleep until when we want…*
>
> *When I was twelve I began to go out a lot, I arrived home at 10pm… because it was when my parents were in the process of separating and they did not pay attention to me. Then, a year ago I was grounded, and now I almost don't go out. I can decide a lot, though. For example, they have always wanted me to study, because they didn't have the chance, and I had always wanted to study* Baccalaureate, *but now I don't*

want to, I want to do vocational training, and they support me as long as I do what I like'. (B018, female, G7).

'My parents control me too much. I would like them to let me do more things. For example, when I want to go out and I am not allowed to because they say I have not studied enough' (B002, male, G5).

Turning to social support, the family was identified by most of the participants as the most important source of support, providing all the different forms of social support. Moreover, adolescents highlighted the unconditional dimension of this relationship. In fact, they all considered members of their families to be among the most important people in their lives, and some of them even included extended family that did not live in the same location.

Notwithstanding that, it is true that the kind of support that they reported to seek in their parents or other family members would normally be different from the one they expect of their peers, who they turned to for advice and support with regard to sentimental relationships, leisure time and also understanding of other questions related to their vital moment.

13.1.3. School context

The school context was discussed through variations of the following questions: *'How is your school?', 'Do you like it', 'How is the relationship between the students? And with the teachers?', 'Do you have opportunities to participate, in school?'.* Adolescents were also asked specific inquiries about lifestyle and dietary habits that sought to know the food environment of the school, as well as possible norms or activities to promote health. These results are presented in the next section.

Almost all the participants stated that they were fond of their schools. Only three of them asserted not liking their centers at all:

'It is like a prison. Teachers are pretty good, and should you have any problem or you need help you can tell them and they will help you. You can always talk with the tutor about personal matters. But I don't have many friends here. I have always felt like the marginalized one because I'm a freak and I don't know very well how to relate to others. I have never had a lot of friends. I have two or three' (B004, male, G6).

'I don't like it at all. Teachers don't know how to teach' (P010, female, G2).

'Well… I don't like it. But I do like the environment. Some people are worth it and others not at all' (P241, male, G3).

Thus, while reasons to not like the school centers were varied, and in most cases they did not necessarily have to do with any social capital related dimension. Reasons to like one's school were especially related to good relationships and/or experiences with people.

'I really like my school. They have Service Learning programs, and they do a lot of things in order to help others and the neighborhood. We try to give things another point of view, because this neighborhood is supposed to be on the bad side of l'Hospitalet and we try to clean its image' (L'H008, female, G7).

'I like my school quite a lot. The one I used to go before was a very different environment and I feel better here, because the people here is more open-minded. In my old school you wouldn't see girls with piercings or dyed hair… and here it's a normal thing' (L'H023, female, G8).

'I think it's very good, because the people here always help you and if you need support they also support you' (L'H028, female, G7).

'The educational level is very good, and the people are very nice. I have fun here' (C012, male, G6).

'We always complain because we have been here for a long time, but when new students arrive they like a lot our school, because they feel we are very welcoming. I feel glad that people can come and feel like they are at home from the first moment' (C010, female, G5).

'I like it a lot. I love the way they teach you not only with regard to school content, but also to be better persons' (C030, female, G5).

'I like my school. We are not very cohesive, everyone has their own group, but that's okay' (B014, female, G8).

'It is fine. A little bit old, and the level is demanding, but I like it. If there are any problems, they want us to solve them. Only if anything serious happens they will intervene' (B059, male, G8).

'We get along really well with people in my class, and the relationship with the teachers is good. For example, we have a lot of trust in our tutor, she always tells us that if we have a problem we can talk to her and she will help us' (P216, female, G3).

'Yes, I like my high-school. Sometimes I get angry and say that I don't like it, because I have had an argument with a teacher or something. But then you compare it with other high-schools, and you realize that you are actually lucky to be here' (P209, male, G2).

'I like meeting people and also learning, but sometimes I get bored. The relationship among the students is good, and with the teachers as well. I think we are a cohesive group. And this year, we also get along with other courses' students, because we have some subjects in common' (P013, male, G1).

'Our high-school is a little old, things are a little bit broken, but in spite of it all I like it. There are all kinds of people, we don't need to be all the same; so I like it' (P007, female, G4).

With regard to participation, it is fair to say that, in general, adolescents in our sample were not very actively involved in their high-schools, rather because they lacked the mechanisms or the interest to participate. INS Eduard Fontseré students were the exception, most likely because the strong commitment of this high-school with the neighborhood and the students, most of whomare immigrant and need specific support to be involved in the community.

'We don't have a very active role in organizing activities or such. In fact, it doesn't really matter, I rather let them do it…' (B059, male, G8).

'At the end of each course we make some suggestions, and sometimes they listen to us and other times they don't. Of course… we cannot ask them to let us play soccer…' (C010, male, G5).

'We don't have many activities to be involved in, at school. For Sant Jordi *or the end of the course sometimes they organize some things. For example, last year we danced… and there are somethings, but people don't participate much'* (P010, female, G2).

13.1.4. Peers context

The questions that initiated the conversation about the peers' context included *'Tell me about your friends', 'How do you feel with them?', 'What kind of things do you do with them?', 'What do*

you talk about with them?'. Next, lifestyle and specific nutrition-related questions were addressed by asking the participants whether they talked about food with their friends, what kind of food they ate when they were together and why they make these choices. Again, these aspects are discussed in the next section.

In almost all the cases, the most relevant group of friends was drawn from the school environment. Exceptions to this were more common among rural adolescents who lived in a different village from the one they studied in. In other cases, too, sports clubs appeared to be the most important source of friendship. Relationships among peers seemed to vary not only among contexts, but also among genders. Girls, particularly from the rural context, reported a lot more of conflicts between the different members of the groups than boys, which seemed to be related to disputes on specific bonds among the different members of the groups. SES differences were not apparent.

> *'I have two groups: one in* Llívia *and a second one in* Puigcerdà. *In the first one we are all boys, and we get along pretty well. In* Puigcerdà *there are girls, so sometimes we have conflicts. I try to stay aside, but if needed, I help'* (P017, male, G1).
>
> *'I have few friends, to be honest. I used to hang out with a neighbor and her friends. But at one point they began to insult me… it was not bullying, but it was harsh for two years. Now I have a cordial relationship with them. I don't like to have problems with anyone, but they hurt me a lot, so I realized they were not worth it'* (B018, female, G7).
>
> *'Sometimes there are conflicts between two of the people in my group. Because I am a friend with both of them, but sometimes they don't stand each other, so…'* (P007, female, G4).
>
> *'There are days that any of them just go bonkers and fight with the other, but in general we don't have a lot of conflicts'* (P010, female, G2).

A further difference with regard to gender was related to the kind of activities that adolescents undertook with their friends. While boys are more prone to practice some kind of sport (soccer, skating, basketball…), girls just hang out, talk to each other, watch movies, etc.

In terms of social capital, friends were accounted to constitute a highly important source of social support, especially **emotional support**. One of the most repeated sentences with regard to friends is that of 'they understand me and will be there for me no matter what. I know I can trust them'. On the other hand, the perception of not fitting into the group is an important source of suffering.

> *'Before, I didn't care. But when you grow old things are different and you need a group of friends. I have ADHD[8] and now I am in therapy at the* Vall d'Hebron *to be able to relate better with others, and I care about it and try to make an effort'* (B004, male, G6).

Not surprisingly, the fact of being alike or different with regard to the group appeared in quite a few conversations. While most adolescents in our sample wanted to fit in, keeping their own identity and individual traits were important for them too:

> *'In my group of friends we all are a little bit different, but of course we have things in common, otherwise we would not be friends!'* (P007, female, G4).

> *'Each one of us has her own personality and way of being. I am totally different for all the rest. Well, we are all different, and I like it. Because if someone was to copy my personality I wouldn't like it at all, and then we would be in a constant conflict'* (P010, female, G2).

Last, lifestyle emerged as a differentiating feature among friends and different groups, especially among girls in the rural context, in which two of the participants directly defined their friends' groups in terms of smoking/not smoking, or drinking/not drinking.

> *'My group of friends… I don't know. They smoke. Two of them don't, however, and sometimes we feel out of place. They don't obligate us to smoke or drink, but sometimes we feel out of place'* (P025, female, G1).

> *'My friends are kind. They smoke, but I don't. They sometimes tell me to try it, but I don't want to because of my health'* (P236, male, G3).

13.1.5. Other relevant social actors

One last question in the social context block tried to identify other possible social actors relevant to the adolescent. It was: 'Apart from all the people we have mentioned, is there anyone else that is important to you and we have not talked about?'. In most of the cases, the answer was no, indicating that the main significant relationships in our sample were embedded in the domains that we investigated. However, some participants highlighted other figures as important social

[8] Attention deficit hyperactivity disorder.

actors in their lives. These were romantic partners (C030, female, G5; P200, male, G4) or parental friends (P007, female, G4; P055, female, G2; P245, female, G2).

> 'We have a neighbor that sometimes comes to have dinner with us or we go to her home. She is like a sister to me. She's 35, but I like talking to her and knowing her point of view on things' (P007, female, G4).

From a social capital approach, these intergenerational relationships may constitute a source of **bridging social capital,** from which adolescents acquire other perspectives and experiences on different issues.

13.2. Lifestyle

In this study, lifestyle has been assessed through two approaches. On the one hand, participants answered the lifestyle questionnaire (Costa, 2014) and, on the other, they were explicitly asked to explain how their lifestyle was. Questionnaire marks ranged from 23 to 40 points (the highest possible score being 45). As shown in Figure 8, differences between the eight groups are not notable, since every group includes individuals with very different scores within. In fact, probably the most relevant pattern we can observe has to do with the dispersion of the different scores within every group. In general, high SES groups (1,2,5,6) tend to have less dispersion in their scores, being concentrated in the first two quartiles. This is specially so in the case of urban adolescents (5,6), who show general high scores in all the subscales, while some rural adolescents display particularly low scores in physical activity, nutrition and toxic habits.

When confronted with the question *'How would you describe your lifestyle',* regardless of their scores all adolescents except three (P216, female, G3; P006, male, G4; B004, male, G6) considered themselves as having a good but improvable lifestyle. Actually, all the responses alluded to either nutrition or physical activity; toxic habits such as smoking or drinking alcohol were not mentioned in this question, nor was sleep or other health-related habits.

> *'I think it is healthy because I do sport and I don't eat junk food, and I do eat healthy foods such vegetables or fruit'* (P236, male, G3).

> *'Well, I think my diet is healthy because at home we eat well'* (B002, male, G5).

'I try to do sport four days per week, and my diet depends a lot on who I am with' (P002, female, G2).

'I think my lifestyle is quite healthy, and in general I think that it is quite good because it is healthy in terms of the foods I eat, and I think I live well' (C022, male, G5).

'I think I should increase my dedication to sports practice, because the only thing I do is Physical Education here at school. But I do not have time for everything. And with regard to my diet, I think that it is quite well, because my parents do the grocery shopping based on a menu and thinking that there are so many days of fish, so many days of pulses… Now, I tend to snack between meals and I should not do that so often' (C030, female, G5).

'I believe it is healthy. I don't like vegetables, but a half year ago I began eating them once a week' (L'H008, female, G7).

'I eat a lot, but because I do a lot of sport, my diet will always be healthy' (P253, female, G4).

'I am very active and do a lot of sport, so I actually think that I can eat whatever I want and I will stay healthy. I think that my body knows what it needs' (C010, male, G5).

Some of them –all from the rural groups- also talked about lifestyle as *the way they live, the way they are* or *how their daily routine is:*

'Right now, it is very active, because I wake up at 8am, go to high-school until 3pm, do my homework, go to dance class, after that I spend one hour or more with my friends and then I go home. It's an accumulation of things' (P010, female, G2).

'This is a more difficult question… I don't know… Restless. I always need to move my hands… I don't know if you have noticed. Or my feet. Sometimes I am talking with my mom and I begin to jump. At school I must avoid buying click pens…. I always need to be touching or doing something' (P245, female, G2).

'I like my lifestyle very much. It is like I have a little bit of everything. Some people focus more on social life than school or family, and well, I can apply myself in my social life, as well as in school. I don't find much difficulty in studying and I do pretty well. Some people need to study more if they want good marks, and therefore they don't

go out so often, or going out may affect some people's marks. I have pretty much everything' (P215, female, G1).

The reasons P216, P006, B004 gave to exemplify their not very healthy lifestyle referred to both: unhealthy eating and lack of physical activity:

'Well, I eat a lot. And afterwards it is very difficult for me to burn it all, because it is my metabolism. But I feel a lot of anxiety and when I am bored, for almost any reason I eat. Besides… I am always laying around doing homework, or playing games, or watching TV…' (B004, male, G6).

'Well, it is not very healthy. Sports and I aren't very good friends, I try to play as much as possible. With regard to food, as I told you before, my father wants us to eat a lot of vegetables, pulses… at home food is very healthy. I don't like it, but this is how things are' (P006, male, G4).

'It is not very healthy. Yes, I am aware of everything, but I find it hard to exercise, eat healthy, cut out Coke… and so on. But I know I have to do it' (P216, female, G3).

Drinking or smoking appeared in some conversations, but it was not included in the discourse of having a healthy or not healthy lifestyle. On the contrary, it was mentioned as an additional and normal activity that adolescents did with their friends, especially among boys in rural areas.

'With my friends we play soccer, then we have something to eat and sit somewhere in our village to talk and smoke' (P017, male, G1).

'We hand out, smoke…' (P241, male, G3).

'We spend the evening together, maybe go to the cinema or have dinner… and then I go home, because they go drinking and I don't like it' (P010, female, G2).

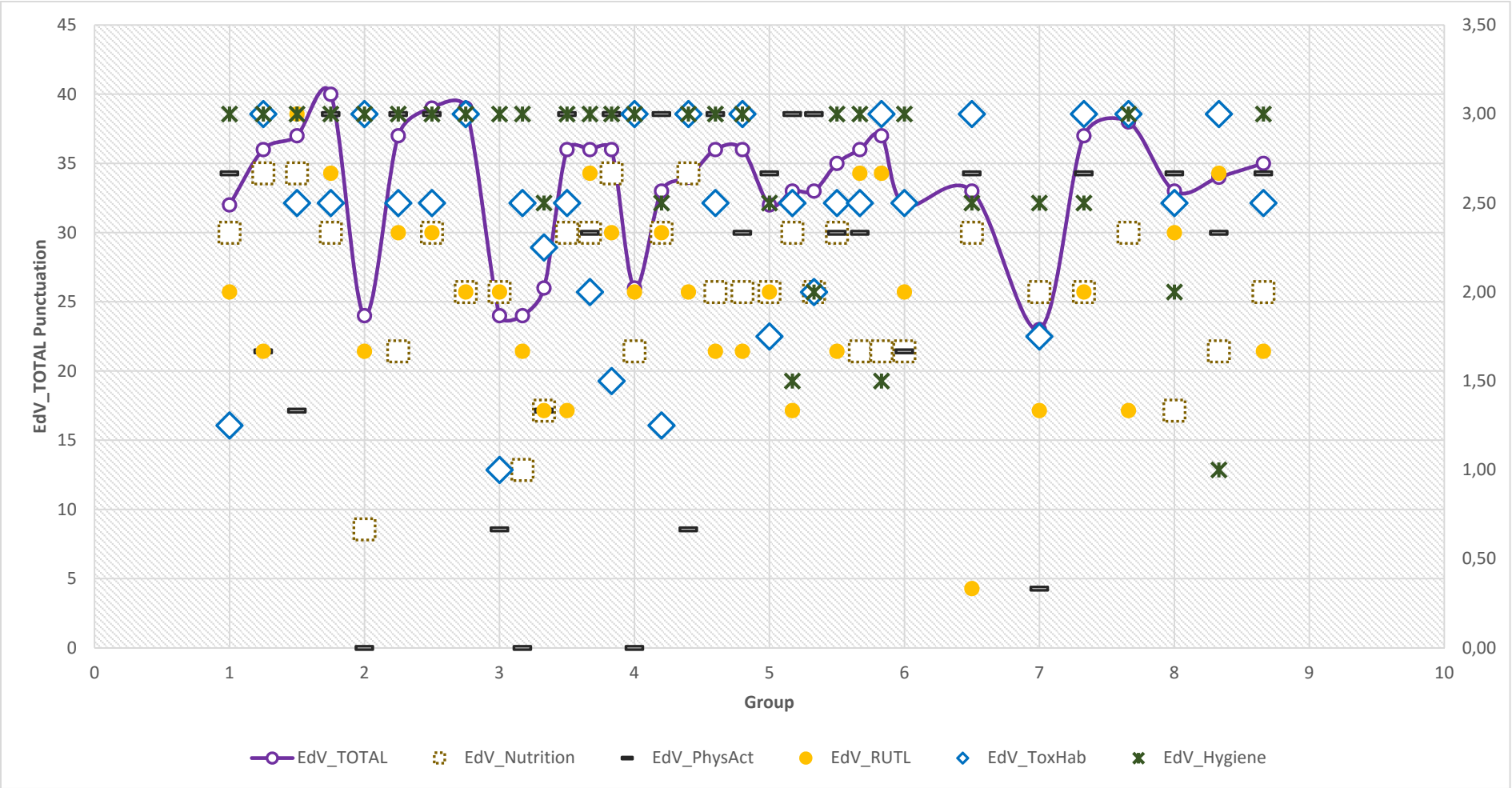

Figure 8. Lifestyle scores of the 33 cases, organized by groups.

13.3. Dietary habits

After this broad question about lifestyle, participants were then asked specific diet-related questions that included variations of the following: *'How is your diet?', 'How would you define eating well?', 'Do you eat well?', 'Why do you eat like you eat?', 'How have you learned to eat how you eat?', 'What things help you to eat well?', 'What things make it more difficult?'. 'In general, what reasons do people of your age have to eat how they eat?' 'How would you say that the different groups that we have talked about earlier influence your lifestyle? Your diet? Do you eat in the same way whether you are with them or not?'.*

Brief responses to the first question *'how is your diet?'* along with their scores in the KIDMED and EdV_nutrition items can be found in Table 22. A few aspects are worth discussing. First, the difference of scores between the KIDMED index and the EdV_nutrition scale. As it has been already explained, dissimilarities stem from the different conceptualization of both scales. While the EdV_nutrition scale compares the proportion in which the different food groups are eaten with regard to the healthy food pyramid, the KIDMED index assesses the adherence to the Mediterranean Diet through 16 yes or no items that, together, produce an overall score that is divided in low adherence (0-3), moderate adherence (4-7 and good adherence (≥8). Although this index have been validated and higher scores have been associated with better micronutrient intakes (Serra-Majem et al., 2004), the interpretation of the total score without proper consideration of the multiple sub-items, may induce to errors. Thus, from the nutritional point of view, it is much more rich and informative to consider the different items as indicators of a healthy pattern or not. For example, P055 [female, G2] had a KIDMED score of 8, which indicates good adherence to the Mediterranean Diet. However, she spoke of not to eat fruit once a day, not having a cereal product for breakfast and consuming candies daily, which from a nutritional point of view should not be considered as a healthy pattern.

Second, if we focus on the perceptions of the adolescents with regard to their diet, two thirds of the participants believed that they followed a healthy diet. However, only 9 of the 33 participants reported eating at least two pieces of fruit per day, and only four consume the two recommended portions of vegetables per day. Moreover, and especially in groups 4 and 8 (low SES, overweight), the intake of fish is low. This gap reflects, on the one hand, a certain degree of misconception about what a heathy diet is and, on the other, a tendency to consider one's health behaviors and outcomes better than they actually are.

Table 22

Self-perception of the participants' own diet and their results on the KIDMED and VT_Nutrition items

Group	ID	Self-perception of own diet	EdV_nutr	KIDMED	Fruit1	Fruit2	Vegetabl1	Vegetabl2	Fish	FastFood	Pulses	PastaRice	Breakfast Cereal	Nuts	OliveOil	No Breakfast	Breakf Dairv	Breakfast Pastrv	YogCheese	Candies
1	P013	*I think it is healthy. My parents have always told me that I should eat this and not that, and I have always had a good diet.*	2.33	5	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	No
	P017	*I like it. I like eating vegetables even if they don't taste very good. I think I have to.*	2.33	5	Yes	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
	P025	*I think it's good. My mom really cares about it.*	2.67	6	Yes	No	Yes	No	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No
	P215	*My diet is healthy. I eat a little bit of everything.*	2.67	5	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No	No
2	P010	*It depends on the day. Because some days I would eat everything and other days I am not hungry and I tell my dad that I don't want to eat.*	2.00	6	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No
	P055	*It is healthy, but sometimes we indulge and eat meat and fries… and other things.*	0.67	8	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	P209	*I think it is healthy. I used to eat mindlessly and now I try to control what I eat, and I think it will be better for me.*	2.33	5	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No
	P245	*I could eat better than I do… Because I don't eat things like spinach or cabbage… But I don't dare to try them.*	1.67	6	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
3	P027	*Not very good. I try to eat a variety of foods, but I don't eat salads, and vegetables only if my mom sushes them*	2.33	5	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No	No
	P216	*Not much. I don't like vegetables or fish at all. I don't care about what I eat or how much I eat. But I know I have to. From now on, I will change it.*	1.00	3	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	P236	*I think it is healthy, because I eat healthy foods such as fruit or vegetables and I don't eat junk food.*	1.33	9	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
	P239	*I have a healthy diet, a little bit of vegetables, sometimes fish, sometimes meat…. Not always fizzy drinks…*	2.33	6	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
	P241	*I don't have a very strict diet, but I think it is healthy.*	2.00	6	No	No	No	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No

	P253	*I eat a lot, but because I do a lot of sport, my diet will always be healthy.*	3.00	3	No	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No
4	P002	*My diet is healthy and not healthy at the same time. I mean, not only do I always eat rice and chicken, but also vegetables, fruit… but then there is junk food, and so on, and it is always appealing, though it not so isn't so good for you..*	2.00	8	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
	P006	*At home we eat very healthily.*	2.00	3	No	No	Yes	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No
	P007	*It could be better, but it is good. Because of the economy, the environment… because of everything. We are too worried about other people and not about ourselves, and it affects me and I don't like it.*	2.67	5	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
	P200	*It is healthy. I try to have a healthy diet.*	2.33	4	Yes	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
	P254	*Not very healthy. I eat because I have to, but I don't like eating.*	1.67	3	No	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
5	B002	*Healthy, because at home we eat well. I should probably eat more fruit, but I think about it and then I forget.*	2.00	10	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
	B016	*Yes. We eat a very varied diet.*	1.67	9	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
	C010	*Yes. We normally eat everything. And I eat what my body asks me for.*	2.00	4	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No
	C013	*Healthy. For example, I don't have pasta for dinner. I only eat vegetables, salads, grilled fish…*	2.33	8	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No
	C022	*I think it is healthy because of the kinds of foods I eat.*	1.67	5	Yes	No	No	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
	C030	*I think I do pretty well, because my parents do the grocery shopping based on a menu and they care that we eat fish, pulses… However, I snack between meals and I should not.*	2.33	8	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
6	B004	*I don't eat well. I will eat everything they give me, but you will have to obligate me to eat fish. I like cold cuts, cookies… but I don't like fruit.*	2.33	3	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	No
	C012	*Healthy. I eat all different foods, without excess: vegetables, fruit, dairy…*	1.67	5	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No
7	B018	*I think I eat pretty well. I eat a little bit of everything: fish, meat, vegetables…My mom is diabetic and takes a lot of care of what we eat. My dad is a cook and cooks very well.*	2.00	6	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No
	L'H008	*I think it is healthy. I don't like vegetables, but there has been a year that I have been eating them once a week.*	2.33	8	Yes	Yes	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	No	No	No	No

	L'H028	*Not very good, because I eat a lot of meat and very few vegetables.*	2.00	2	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No
8	B014	*I think my diet is quite bad, because I have never liked vegetables.*	1.67	2	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No
	B059	*It is quite healthy. I don't like sweets. I eat vegetables, fish, meat…*	1.33	7	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No
	L'H023	*Not very good, because now I babysit for my cousin and they give us a lot of candies. But apart from that I barely eat. Only for lunch, because my mom makes me eat, and then I have something simple for dinner, such as milk and a cookie or cereals. I can't eat.*	2.00	4	No	Yes	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes

Turning to the question of whether the social environment shapes eating behaviors, the strength of this relationship is evident. Eating is a social behavior, although, as we will see, it was perceived by many of the adolescents in our sample as something quite private and intimate. From a social capital perspective, and consistent with the broader body of literature on social capital and health, we identified two main mechanisms through which social capital may influence eating behaviors: **(1) social influence/social control and (2) exchange of social support.** In the following pages we discuss how the four different domains we examine (community, family, school and peers) affect dietary habits through these pathways.

During our interviews, with the question 'Where did you learn to eat like you eat?' we sought to identify the most relevant domain in the eating habits of our sample. In a very strong way, their answers directly pointed towards family, parents in most (31) of the cases.

As an exception to this generalization, two participants also referred to the school as the place where they had learnt about a healthy diet. These two cases corresponded to participants with overweight.

> *'I learnt to eat as I do at my grandmother's, because she always cooked me what I wanted, steak and fries. But if I think of where I have learnt to eat well, it has been at the school canteen. In fact, my parents made me go to the school canteen to learn how to eat well'* (B014, female, G8).

> *'Well, you know, when you are a kid and they explained the food pyramid to you and so on. And I tried to apply it a little bit… by eating quite a lot of carbohydrates. But the way you learn at home is different. You learn by seeing what your parents eat and do'* (C012, male, G6).

In one case, the adolescent even admitted using what she learnt at school to teach their parents (L'H023). In most cases, though, when specifically asked about what they had learnt about healthy eating at school, most participants acknowledged that they had had some diet-related activities, but did not end up putting into practice what they had been taught.

> *'I try to eat five meals, but I do not follow the pyramid'* (C010, male, G5).

> *'In primary school we had some classes where they taught us the food pyramid and to eat five a day, but I've never applied it'* (P017, male, G1).

The pathways through which family (especially parents) seemed to have a greater effect on eating habits was **social influence and social control**, especially through the existence of shared norms and values, and the exercise of control from the parents.

With regard to **norms and values**, we were especially interested in those that could influence lifestyle and other health outcomes. Family norms around food and nutrition condition the kind of food available at home, the way in which family meals develop, the decisions that adolescents are able to make around their diets, and also the reasons why adolescent make these decisions. Conceptualized this way, **norms and values** is a highly interrelated category with **autonomy and control**. The questions that sought to gather information on this domain included variations of: *'What degree of decision do you have around the things you eat?' 'Why do you eat like you eat?', 'Based on which factors do you decide what to eat?', 'Based on which factors do your parents decide what you eat at home?', 'Does everyone in your household eat the same meals?'.*

> *'Yes. That's one of the rules we have at home: we eat lunch and dinner together, and with TV volume turned off'* (P254, female, G4).
>
> *'Sometimes I participate in deciding what to eat. My parents ask me what I feel like'* (B014, female, G8).
>
> *'I normally eat fruit for dinner, because most times I am not very hungry. I like fruit, but it is not my favorite food. I eat it because I am obligated to. If I could choose between tiramisu and an apple, I would choose tiramisu'* (C013, female, G5).
>
> *'I have tried to eat salad more often. I have not tried to make any more changes because if I bring this topic to the conversation my mom will say I am nuts. I never bring this topic to the conversation at home.'* (L'H028, female, G7).
>
> *'Most of my meals are decided by my parents. But, for example, on Sundays we always make like a plan of the next week in order to see what we will eat, and we participate in this'* (P010, female, G2).
>
> *'I don't have much choice about what I eat at home because everything is set out for us. For example, we eat fish three times per week, vegetables… not always the same kind, the specific product changes, but the general framework is decided by our parents, because they want the best for us. If yesterday we ate this, then they don't want us to eat it again. They care about our health'* (P025, female, G1).

'At home, my mom always prepares everything for the whole family, except for my sister who cooks for herself. Vegetables and so on…' (P216, female, G3).

'I don't have breakfast. When I was in primary school I did, because my mom looked after me. In fact, there was a time when I got sick very often, because I did not eat absolutely nothing until 4pm. And now my mom makes me have breakfast everyday' (P254, female, G4).

'I eat what I eat because it is what I am given. I don't choose, I eat what my parents give me. My parents decide my breakfast, lunch and dinner' (P013, male, G1).

'From my point of view, my diet is not very good. Because I eat a lot of meat and few vegetables. My mom doesn't know how to cook a very varied diet. For example, she doesn't know how to do purees… and she does a lot of fries, meat… fish… but not that much' (L'H028, female, G7).

'What I have learnt at home or school about healthy eating… I don't put it into practice. I would say my family does. I would not say 'today I have learnt this, so I am going to make changes'*, no. And it is not that I don't want to apply what I have learnt, but I don't feel responsible for what I eat. More my parents', you know? If they would have liked to eat more fried foods, have a poor diet… I would have most likely had a bad diet and I wouldn't have worried'* (P215, female, G1).

'The most important reason that my mom takes into account while planning our diet is money. We then vary and eat pasta, vegetables….' (P007, female, G7).

As we can observe, our sample' diet was highly dependent on their parents' decisions which, as all adults, were in turn influenced by elements such as knowledge, cooking skills, economic resources and motivations around food, which in most cases seem to be guided by health concerns. Therefore, the dietary habits and the quality of the diet of our sample depended, to a great extent, on their parents'. For example, food availability at home came up as something that limited the intake of foods such as vegetables or fish.

'I don't eat fruit every day because I don't like it much. Besides, my parents don't buy it. And with fish it's similar: we eat fish once a week maximum, because we don't have the habit of eating fish more often' (P006, male, G4).

Maternal dietary habits are known to be a strong influence on children's intake. From a social capital approach we could think of it in terms of **social influence** mediated through the establishment of **norms and values** at home, and also as something that strengthen **sense of belonging** and **family cohesion** (we can think about '… at our home we do…'). We aimed to take this aspect into account by knowing how maternal diet was, besides asking the adolescents how their parents influenced their diet. In consequence, we gave all the participants a copy of the PREDIMED questionnaire, which assesses adherence to the Mediterranean Diet in adults. Out of the 33 participants, only twenty of them returned the PREDIMED questionnaire duly filled in. What we see in Table 23, is that when maternal diet does not follow the Mediterranean pattern (low adherence), neither do the children. In our sample, only adolescents whose mother had at least a medium score, showed an optimal adherence to the Mediterranean Diet.

Table 23

Adolescents' KIDMED and maternal PREDIMED results.

Group	ID	KIDMED	PREDIMED
1	P025	medium	good
2	P010	medium	low
2	P055	good	medium
2	P209	medium	medium
3	P027	medium	medium
3	P216	low	low
3	P236	good	medium
3	P239	medium	medium
4	P002	good	medium
4	P006	low	low
4	P007	medium	low
4	P254	low	low
5	B016	good	good
5	C030	good	medium
6	B004	low	medium
7	B018	medium	medium
7	L'H008	good	medium
7	L'H028	low	medium
8	B014	low	low
8	L'H023	medium	low

Within the household, of course, fathers and siblings also influence other members' eating behavior. For example:

> *'Well, there's something that I haven't told you and maybe it's interesting. When there is broccoli for dinner, which I don't like, my brother and I we have the joke that 'it is 'chemo', because we have heard that they say that it compensates for burnt food. Because someone explained to us that when we eat burnt food it remains it the stomach and it isn't good for your health, and broccoli removes it. That way, I eat broccoli'* (B002, male, G1).

> *'Sometimes, I eat things that I don't like so that my sister will eat them too'* (B004, male, G6).

> *'My father lifestyle and diet are very good. My mother's not that much. But we all eat healthier because of my dad'* (P006, male, G4).

However, with a broader scope, it became evident that when adolescents had to actually make their own decisions about food (mostly the afternoon snack, when eating out with friends and when being alone at home), they hardly ever chose something based on what they learnt at home, but on taste and convenience. In fact, when asked what their food decisions were based on, all of them mentioned *taste, food preferences and/or time.*

When asked about whether they tended to take health into account when making food choices, a confusion between body image and health arose. In many cases they said that yes, in general, people of their age made healthier choices when wanted to take care of their body. Then, we asked again whether they were actually concerned about health or esthetic reasons, and adolescents in our sample acknowledged that it was body image.

> *'Most of us don't take health into account. Well, some of them if they want to take care of their image'* (P253, female, G4).

> *'I think that girls do take health into account. Boys too, because some of them want to look stronger, and they avoid fats and so on. […] But you are right, it has more to do with body image than health'* (P013, male, G1).

> *'When I say that we think about our body… I believe that we actually think more about our physique than about our health'* (C022, male, G5).

In fact, the fact that body image is more relevant than health in our sample, becomes evident in the number of adolescents that have said to have or have experienced some sort of disordered eating behavior, or that they have talked about a friend in this situation. B004 (male, G6) recognized losing control of his intake due to anxiety, B014 (female, G8) and P007 (female, G4) mentioned having used vomit to control/lose weight. L'H023 had also suffered anorexia and, with regard to her current diet she said that 'she almost doesn't eat'. These four cases corresponded to overweight participants, reinforcing the notion that disordered eating and overweight and obesity are much more related than it had been usually thought. B002 (male, G5) referred to a friend of him who has suffered anorexia; P010 (female, G2) and P254 (female, G4) mentioned having periods of eating very scarcely. P055 commented:

> *'I eat what I want in that moment, but if I were to see that I was gaining weight I think that I would change. Sometimes I see people who are overweight, and I think '*I don't know why they don't exercise or something'. *I wouldn't like to look like that at all'.* (P055, female, G2).

Trying to understand the reasons driving adolescents' choices, health does not seem relevant for them at this point. When they were asked why, many responses indicated that adolescents thought that they would still have time in the future.

> *'I believe that you think that you are young and you tell yourself that you'll improve when you're older. But then you never do.'* (C012, male, G6).

> *'Adolescents we only think of having fun'* (P007, female, G4).

In order to comprehend how social capital in the peer domain could influence our sample's eating behavior we asked them whether they talked about food with their friends, what kind of food they ate being with them and if they changed what they normally eat because of being with their friends. What we observed is that they barely talk about nutrition with friends. Apart from **social influence** when eating together, which does affect what they eat, explicit **shared norms and values** among peers are not especially relevant for the eating habits of the adolescents in our sample. Food or healthy nutrition was not a topic of conversation for the adolescents in our study, beyond the habit of commenting on what they have eaten with their families. However, we were able to identify some tacit norms among peers, related to the kind of food they eat together (normally not very healthy food), and to the social influence of thin and toned bodies' ideal to which all of them (all of us, actually) are subject to.

With regard to the effect of friends on eating behaviors when they have meals together, shared norms and values seemed to be more important theme among most boys, who affirm that eating a piece of fruit as a snack in the afternoon would lead their friends to probably laugh at them. In fact, it was particularly the case for boys who said they would feel shy about sharing with their friends concerns about healthy food. Girls, in contrast, tended to talk a little bit more about food, particularly those concerned the most about their body image.

In any case, almost all the participants said that they would not change what they wanted to eat only because they were with their friends, transmitting **autonomy** on their decisions from the rest of the group. However, most of them would probably not eat a piece of fruit and some of them gave us examples of how they change their choices because of their friends. On the other hand, however, they acknowledged eating more junk food when they were with friends, because it is more fun, tasty and convenient, and that when they see a friend eating something they would feel like they wanted it too (which bring us to **social influence**).

> *'We have lunch together with my friends once a month, to talk about things, because we are in different groups and don't see each other that much. So, if, for example, I want to eat an ice-cream and they don't, I'll have it anyway'* (P254, female, G4).

> *'Yes. Sometimes it makes me change the way I eat. For example, the other day I could choose between grilled or battered meat. And my friend wanted it grilled, and I felt like eating it battered. And then she asked why I was going to eat it battered, and I changed to grilled meat'* (C013, female, G5).

> *'Being with friends does influence what you eat. Because I will end up eating the same as them'* (C022, male, G5).

> *'At home, I maybe eat an apple as an afternoon snack, but if I am with friends I will eat a croissant or fries. It would not be normal that everyone eats fries and I eat an apple'* (P007, female, G4).

> *'If I wanted do go on a diet my friends would not tell me anything. Or well, they would maybe say* 'you're a pussy'' (P017, male, G1).

Lastly, adolescents were asked whether they had ever tried to change their dietary habits with the aim to see potential enablers or barriers that they could find in their social context. When they had never tried to do so, they were asked to imagine what would happen if they eventually

decided to go vegetarian or to eat more fruit. We opted by proposing these examples in order to avoid potential conflicts with restrictive diets, eating disorders or other potential confounders.

> *'If I decided to be vegetarian, my mom wouldn't let me. She would say that we need to eat meat and then I would say to her that okay, I will eat meat'* (C013, female, G1).

In a second phase, we explicitly asked them what factors helped them and which made it more difficult for them to eat healthily. With regard to barriers, price was mentioned by L'H028 (female, G7), P007 (female, G4), P010 (female, G2). Lack of cooking skills was also a common difficulty. Being with friends was viewed for some as an additional difficulty, although on the other hand some of the adolescents in our sample (P017, male, G1; P241, male, G3; B002, male, G5), said they would avoid eating cookies, pastry or other kind of foods if they were with a friend that needed to take care of his/her diet. Similarly, C013 (female, G5) and C030 (female, G5) talked about when they went out with vegetarian friends or someone being on a special diet they all chose specific places where all of them could eat well. The most named barrier to healthy eating in our sample was junk food good taste and availability. On the other hand, support from family (and, in some cases, friends) was seen as something that would help to improve dietary habits.

Finally, we wanted to know where they could draw social support from to make changes in diet. Family members, especially mothers, were the most cited resource. The above-mentioned embarrassment to talk about one's own dietary habits with friends may contribute to this choice. Some of them, too, referred to internet. Nutritionists were only named by two of the participants, both in group 5 (high SES, urban, normoweight).

> *'I have never thought about it… I would probably ask my mom'* (B002, male, G5).

> *'If I wanted to change my diet I would talk to my parents first… and then maybe go to a nutritionist'* (B016, female, G5).

> *'I wouldn't talk about it with my friends. I'd rather ask my parents and according to their opinion I'd look on the internet'* (C030, female, G5).

> *'I'd ask my mom or my grandma, because they are well informed'* (P017, male, G1).

> *'I'd ask my mom or a doctor. Not my friends. I find it surrealistic that they count calories!'* (P254, female, G4).

The community and school context did not appeared to play a relevant role in influencing the dietary habits or be an important provider of social support in our sample.

Discussion

Lifestyle, eating habits and obesity, at all ages, are considerably complex issues in which a myriad of factors are involved. Here, we have aimed at providing a general overview of this phenomena during adolescence, focusing on one particular aspect: the possible effect between social capital and the family environment in obesity and some of its related behaviors, with a particular focus on diet. Additionally, we have included in this research other lifestyle elements that are associated with these and also affect adolescents' health.

This section will be organized according to the research questions formulated at the beginning of this dissertation. Thus, the main research question of this thesis ***'How is social capital related to the lifestyle, dietary habits and weight status of adolescents from different socioeconomic contexts?'*** will be answered through the response to its secondary research questions.

Question 1.1. *'What are lifestyle, dietary habits, weight status and social capital of adolescents from different socioeconomic contexts?'* was addressed through study 1 and study 2. In both of them, participants were 14-16 years-old adolescents from four different urban and rural socioeconomic contexts. The purposeful sampling strategy used in this research does not allow to generalize the results to other groups of the population. Besides, the use of schools as a sampling unit also influences the results, given the fact that students in the same are exposed to common conditions. In our case, however, this was an intended decision, as one of the purposes of our study was to take environmental influences into account. Thus, while the four groups chosen in this research aim to represent four different socioeconomic contexts, caution should be taken when extrapolating this results to other groups. Notwithstanding this, purposeful sampling it is a useful method to identify tendencies and it is an appropriate choice at the onset of the investigation on a novel question, as it is our case when exploring the relationship between social capital in different domains and lifestyle and dietary habits indicators in adolescents (Kothari, 2004).

1. The lifestyle, dietary habits and weight status a sample of Catalan adolescents from different socioeconomic contexts.

In general, adolescents in our sample showed improvable, yet not terrible health indicators. In agreement with the results by Costa-Tutusaus (2014), their SRH was above *good* in more than 90% of the cases. SHR has been shown to be a good indicator of mortality over a period of four to nine years, and also to be related with risk behaviors such as smoking, exercise, sleep and body weight (Zullig, Valois, & Drane, 2005). In our sample, the fact that SRH was positively associated with BMI and also with the practice of physical activity and consumption of fruit closer to the dietary recommendations – both of them health-protective behaviors, seems to point toward the same direction. Besides, most studies have found an association between SRH and SES in all age groups. Again, our data confirmed this association, although differences in the SRH marks were not significant between socioeconomic groups.

The prevalence of overweight or obesity in study 1 was close to 16%, with the highest rate in the rural group (19.59%). Study 2 did not provide information about the different distribution of weight status between groups, given the fact that sample in study 2 was selected according to BMI, SES and urban or rural context criteria. Data from study 1 are consistent with the results of the enKid study (Aranceta, Pérez-Rodrigo, Ribas, & Serra-Majem, 2003a) and the study by Coronado-Vazquez and colleagues (2012), who also found higher rates of obesity in rural areas.

Contrary to most mainstream investigations on the topic (Cutler et al., 2011; Hallström et al., 2011; Moreno et al., 2005; Serra-Majem et al., 2003), though, the highest rates of obesity among urban adolescents in our investigation were found in the urban-medium group (SES measured through the area's gross disposable household income). It has been already warned that these data must be read carefully, since 21.05% of the urban-low group did not provide the necessary information to calculate BMI, so prevalence in this group (07.89% of the responses) could be potentially higher. In any case, SES neither appeared to be associated with BMI when measured through parental education.

Two main hypothesis are likely to underlie the lack of association between SES and BMI in our sample. On the one hand, it is possible that, adopting a life-course approach (Berkman & Kawachi, 2014; Blane et al., 2007), the effect of SES on BMI is still not visible, although the nutritional habits of the urban-low sample are consistently worse than the other groups'. Following the conceptualization provided by Blane and colleagues, it could be explained by both the accumulation and the pathways models of etiologic periods. On the other hand, it could also be due to the existence of confounders that might be affecting the relationship between SES and BMI, such as race/ethnicity, as reported by Bennett and colleagues (Bennett et al., 2008),

or social capital, as reported by Evans and Kutcher (2011). The fact that urban-low adolescents in our sample showed higher social capital scores could support Evans and Kutcher conclusions.

With regard to lifestyle indicators, we can compare our results in study 1 with the ones obtained by Costa-Tutusaus (2014), in a sample of approximately 2,000 Catalan 13 to 19 year-old adolescents, which is, to our knowledge, the only published study in which the results of the VISA-TEEN questionnaire have been reported. The overall mean score of our sample (35.21±4.58) was slightly higher than the one reported by this author. However, consistently with his results, most of our sample obtained scores between 35 and 40, indicating health-promoting lifestyles. Socioeconomic differences were not significant whether SES was measured through the area's gross disposable household income or parental education. This result diverge from the one obtained by Costa-Tutusaus itself or other researches on Spanish adolescents' lifestyles (MSSSI, 2013; Ramos, 2010), which found a relationship between lifestyle and SES, measured as family income through the *Family Affluence Scale II (FAS II).*

Turning to the different components of the lifestyle questionnaire, Physical Activity mean score of our sample (2.08) is similar to the obtained by 15 and 16 year-old adolescents in Costa-Tutusaus's study (1.99-2.07). On the contrary, the lower practice of physical activity found in the rural sample of our study contradicts not only the ones by Costa-Tutusaus but also others', as indicated by De la Cruz et al. (2012). SES differences were not significant, although scores were lower among the urban-low group. The multiple cases study conducted in our sample (study 2) allow us to hypothesize that the differences among the four groups might be due to different opportunities to participate in sports organizations due to availability and cost of the activities, and not to a more active way to spend leisure time in the urban-medium and urban-high groups. In agreement with the results of most of the researches on adolescents' lifestyle such as the HELENA (Moreno et al., 2014) or the HBSC studies (MSSSI, 2013) and the review by Sallis and colleagues (Sallis et al., 2000), boys in our sample were significantly more active than girls.

As for the Rational Use of the Technological Leisure (RUTL), our results are consistent with the ones by Costa-Tutusaus (2014), in the sense that RUTL scores were very homogeneous among the four groups. We agree with the author in interpreting this result as a sign of the universalization of the ICT. The results of our sample with regard to Hygiene are also aligned with different researches in which young females have better scores than males (Costa-Tutusaus, 2014; MSSSI, 2013).

SES differences in the lifestyle questionnaire components existed only in the case of Toxic Habits and Nutrition. With regard to Toxic Habits, the urban-high group exhibited the lowest mean

score, while the best results were obtained by the urban-low group. This fact deviate from the results of other studies, which show a greater consumption of legal and illegal drugs among lower SES groups (Fundación Eguía Careaga, 2014). Consistently with the same studies, though, the rural group in our sample showed a higher consumption of toxic substances when compared with the other two urban groups. In the same way, the mean score of our whole sample is similar to the one reported by Costa-Tutusaus in 15-16 years-old adolescents in his study.

Among the different health and lifestyle indicators assessed in our study, diet related-indicators showed the strongest relation with SES. While the total KIDMED score was not significantly different among the four groups, half of its items were, as it was the specific Nutrition component on the VISA-TEEN questionnaire. Here, our results were consistent with most of the studies on adolescents' nutrition in Spain and other countries (Aranceta, Pérez-Rodrigo, Ribas, & Serra-Majem, 2003b; Diethelm et al., 2012; Moreno et al., 2004): lower SES groups have worse dietary habits, especially with regard to the consumption of fruit, vegetables, fast food and the intake and composition of breakfasts. For instance, in our sample more than half of the urban-low group manifested not consuming breakfast regularly, and almost 37% ate pastry in this meal, which means that, actually, the percentage of this group having a proper nutritional intake in the morning is very narrow. This fact, along with the poorer overall dietary intake in lower SES groups, should be an additional reason of concern with regard to health inequalities, because inadequate nutrition does not only impair health (WHO, 2014a), but it has also been related to worse academic achievement (Sánchez-Hernández & Serra-Majem, 2000), adding a further detrimental factor to adult health and wellbeing during the lifecourse. Also in agreement with previous researches (Bargiota, Pelekanou, Tsitouras, & Koukoulis, 2013; Grao-Cruces et al., 2013; Serra-Majem et al., 2004), girls obtained better scores than boys in the KIDMED overall score, although differences in the Nutrition component of the lifestyle questionnaire were not significant.

In general, these results indicate that the diet of the adolescents in our research need to be improved. Even if the average score of our sample in the nutrition component of the VISA-TEEN questionnaire was above 2 points (which presumably indicates a diet pattern that, overall, promotes health) and more than 80% of the sample showed an average or good quality of their diet according to the KIDMED index, from a nutritional point of view it is worrying that only 34% of the participants ate the two recommended portions of vegetables and that the same amount did not even consume this food group once a day. Along the same lines, more than 40% of the sample did not meet the recommendation of eating fish 2-3 times per week. Considering these dietary habits, it is very difficult to meet the recommendations on essential nutrients such as

omega 3 fatty acids, vitamin D, iodine, zinc or selenium among others (Muñoz-Hornillos & Martí del Moral, 2008).

In addition, our data show that, unlike other lifestyle and health indicators, the association between dietary habits and SES is quite notorious. A further observation is the fact that in both, the VISA-TEEN and the KIDMED questionnaires, global scores are less sensitive to sociodemographic factors than their intermediate scales, probably because the fact of summing up different subscales blurs differences among in the *healthiness* of different behaviors; an added reason that supports the need of focusing in the different dietary behaviors.

2. The social capital of a sample of Catalan adolescents from different socioeconomic contexts.

Besides lifestyle elements, we sought to examine the social capital of the adolescents in our samples in four different domains: family, school, community and peers. Because the main instrument that we have used in the quantitative study –the family social capital questionnaire- has been specifically developed for this research, along with the fact that evidence about family social capital on health and in adolescents is very scarce, a thorough comparison of our results with other data will not be possible, at least in relation to the family environment. A modest larger amount of research has been conducted on neighborhood/community social capital, which will make comparisons more feasible, although these will have to be taken carefully because of the cultural specificity of social capital and also to the different measures used in the different studies, as mentioned earlier. In any case, the mixed nature of our study has allowed us to depict and comprehend how different social aspects in each domain interact to generate social capital that adolescents in our sample can turn to.

Our results confirmed the different layout of social capital in different domains. Study 1 did not tap into the possible effect of the peers, beyond school relationships of trust among students, nor bridging social capital outside the family environment. However, the multiple cases study allowed a more thorough comprehension of these features.

Both studies 1 and 2 suggest that, at the neighborhood level, adolescents' social capital could be more accurately conceptualized following the social cohesion approach, which taps on aspects such as closeness and solidarity within groups, rather than on close strong ties among individuals. In this way, community social capital would not depend so much on the personal relationships that the adolescents maintain with other individuals in their communities, but on the cohesion of the collective network. Otherwise, significant relationships in the community

domain would become friends, and more likely be included in the "peers or acquaintances" domain. To some extent, the school and family environment could be compared to small communities, where closeness, trust and reciprocity among the whole community (students, teachers and other actors involved in the case of school; and family members in the case of the kin) also condition the level of social capital. However, in these cases, interpersonal relationships understood as *network*s *property of the individual* (this is, social capital defined following the social network perspective), acquire an important relevance, which supports the notion that both the social cohesion and the social networks approaches to social capital are complementary and necessary to fully understand social capital (Kawachi & Berkman, 2014; Porta, 2014).

Our results, especially through the multiple cases study, which contextualizes the results of study 1, indicate that, at least in relation to health, family and peers are the most influent sources of social capital for adolescents in our sample. These findings support the ones by Morrow (Morrow, 2004) and Morgan (2012), and are especially evident in the width and depth of the discourse that the participants have on the different domains, which is much more extensive when they speak about their families and friends than when they do so about their neighborhoods and towns. In our view, the difference of structural and cognitive social capital is especially appropriate here. As highlighted by Fergusson (2006), Morrow (Morrow, 1999, 2001, 2004) and Harpham (2002), youth' experiences of the communities they live in are highly conditioned by their opportunities to participate and engage in them. This is, the way in which they experience their communities depend on their degree of involvement, which, in general terms, seems to be more customary in rural contexts, except in the urban cases in which families have resided for generations in the same neighborhood and/or when the presence of community associations is very vivid.

Thus, in our investigation, the domains in which the experience of participating in social networks is done in first person, as it is the case of the family, school and peers spheres appear to be much more influential on the adolescents' lives. In this sense, another relevant finding of this dissertation, is the fact that the *composition* of the different groups (for example, the number and gender of friends, or the composition of household families), do not necessarily conditions social capital, or at least it does not do it in an evident way. Thus, differences in the resources that adolescents can access through their membership in different social groups are more related to the kind of bond that the different actors maintain, than to the composition of the groups itself.

Social capital and its association on lifestyle and dietary habits did not vary significantly depending on the autochthonous or immigrant parental or adolescent origin. However, we agree with authors such as Litwin and Stoeckel (2014) and Morgan (2011) whose research suggest that this is a point that requires further investigation.

3. The effect of social capital on the lifestyle, dietary habits and weight status in a sample of Catalan adolescents from different socioeconomic contexts.

Next, we discuss research questions 1.2 and 1.3 together, because of the high interrelationship of these two queries. One of the interests of our research, which motivated the selection of our sample in four different socioeconomic contexts was, on the one hand, to investigate possible differences in the amount and types of social capital available to adolescents in the different social domains (which has been discussed in the section above) and, on the other hand, to find out whether the potential effect between the social capital available and the health outcomes we studied was the same when taking into account demographic variables such as living in a rural or urban context, SES (measured either through the area of residency gross disposable household income or through parental education), parental origin (autochthonous or immigrant), the adolescent origin (autochthonous or immigrant) and household composition.

As explained in section 11.2, with the aim to ascertain whether these demographic and social capital variables made a significant contribution to explain our outcome variables when holding constant all the other variables, we opted for developing logistic regressions for some of our dependent variables. However, regression models were only feasible for BMI and SRH and, as predictor variables solely included a family social capital indicator, gender and SRH or BMI, respectively. These results lead to two important implications.

First, the fact that contrary to most of the mainstream investigation on the topic, when all the explanatory variables included in our research were taken into account, SES was not significantly related toneither BMI of SRH. On the contrary, differences in these variables were only explained by different levels of family social capital (measured through different indicators), gender and SRH or BMI depending on the case. More specifically, higher levels of family social capital diminished the likelihood of being overweight or obese by 76% and the probability of reporting bad SRH by 50.6%. Being female, in turn, was protective against BMI, while it increased the odds of reporting poor SRH. As expected, higher BMI entailed lower SRH scores. Overall, these results support the notion that the social capital available in the family environment, more than in any

other and more than more studied social determinants such as SES, is paramount for the health behaviors and outcomes of adolescents.

Second, because it was not possible to develop regression models for the other dependent variables in study 1, it is not appropriate to refer to the *effect* of the different independent variables on these outcomes variables in this study, and it is only correct to talk in terms of correlations between them. Study 2 do provide some clues to go beyond associations, and to hypothesize possible causal paths through which these associations happen. In this case, further research is needed to detangle actual causal relationships. Hence, research questions 1.2 and 1.3 can only be fully answered in terms of correlations, although data from study 2 allow to formulate possible pathways linking these associations.

Thus, with the aim of integrating question 1.2. *'Does social capital in the family, peers, community and school domains are differently associated to the lifestyle, dietary habits and weight status of adolescents from different socioeconomic contexts?'* and question 1.3. *'Do the different dimensions of social capital in the different domains are differently associated to the lifestyle, dietary habits and weight status of adolescents from different socioeconomic contexts?'* Figure 9 and 9 summarize the results of study 1 and 2 on the association of the different dimensions of social capital in the different domains in the selected health-related indicators, as well the pathways through which they potentially act. In order to make these diagrams more understandable, and because of the impossibility of developing regression models, only bivariate correlations can be shown, we have not included the sociodemographic variables in these figures. Blue and green arrows represent relationships derived from the qualitative, while black arrows depict associations derived from the quantitative study. As the reader can observe, study 1 allows to establish a greater range of associations between social capital and lifestyle indicators. The multiple cases study, in turn, permits to identify possible mechanisms through which these relationships are stablished.

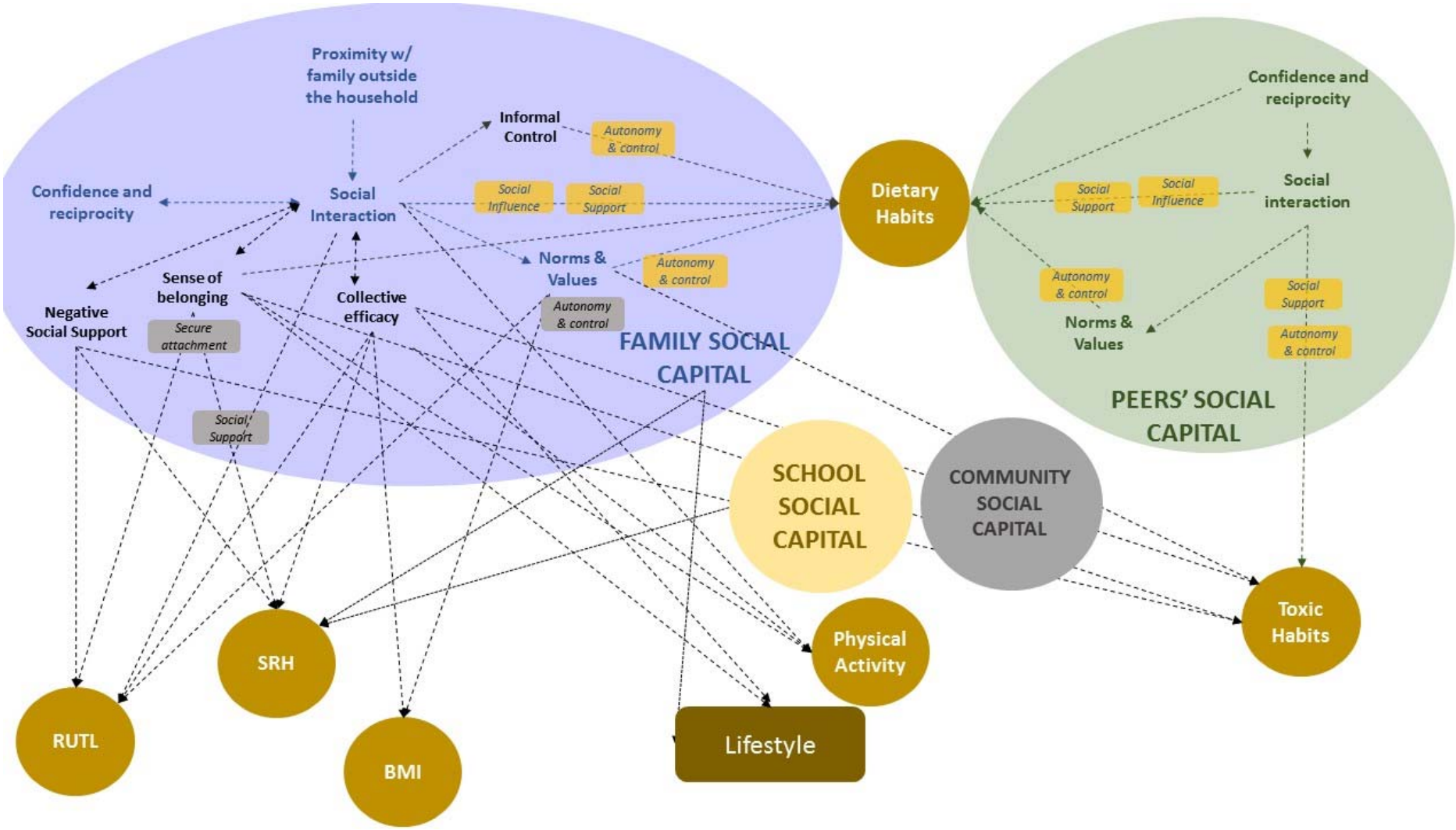

Figure 9. Summary of findings on the association of the different dimensions of social capital in the different domains with the selected health-related indicators and the pathways through which these associations happen.

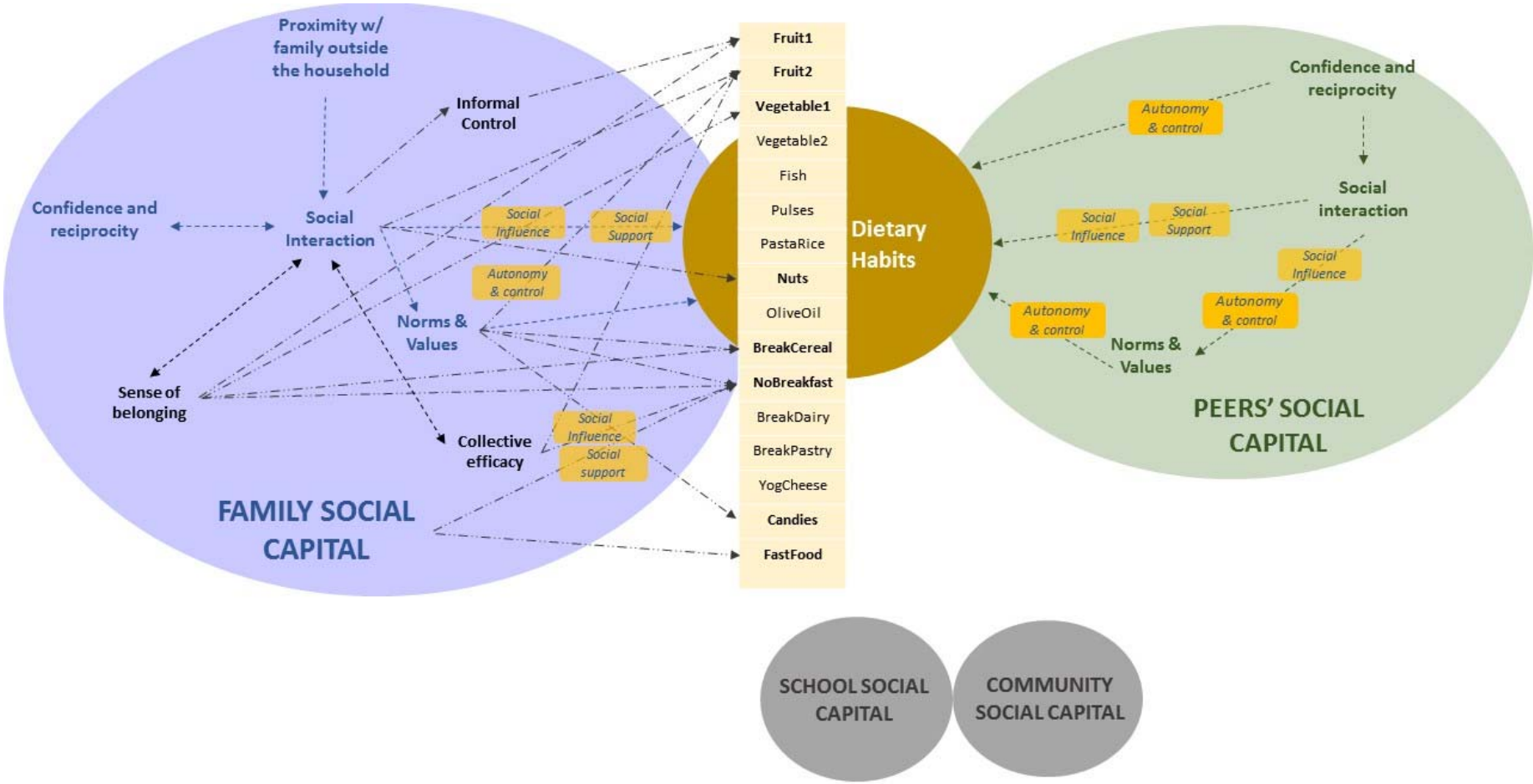

Figure 10. Summary of findings on the association of the different dimensions of social capital in the different domains with different dietary behaviors and the pathways through which these associations happen.

As explained above, our results support the notion that the social capital available to adolescents in the family, school, community and peers domains encompass differences, which necessarily influence health in different ways and through different pathways. These differences are even clearer if, following Morgan (2011), we conceptualize social capital as a health asset for youth. Thus, the resources that adolescents can access through their social connections are different depending on the quality of these bonds.

In this way, while the different subdimensions of family social capital displayed significant correlations with all the health outcomes in study 1, peers' social capital was only associated with toxic habits and school social capital with SRH. These data are consistent with the results by Morgan (2011), in which higher connectivity and sense of belonging with other students was related to a better wellbeing perception. In any case, we cannot disregard the possibility that, as suggested by Kubzansky and colleagues (2014), these results are confounded by a third more subjective variable such as hostility perception, self-esteem or negativity, which would be influencing both social capital and health-related indicators. Study 2, in fact, would support this theory, and the high correlation between BMI and SRH might also be partly explained in these terms.

On the contrary, community social capital was not correlated with any of the health indicators in our research. These results oppose studies such as the ones by Evans & Kutcher (2011) and Morgan (2011), in which community social capital was associated with health outcomes such as BMI or smoking habit. Nevertheless, as Morgan itself explain, and in agreement with previous researches (Morrow, 2003, 2004; Weller & Bruegel, 2009), the relevance of community in adolescents' life is reduced when compared to interpersonal relationships within the family or peers' networks.

Within the family domain, the distinction between composition and functioning is utterly important. In agreement with others' results (Gray et al., 2007; Moreno et al., 2004), no association has been found between family composition and health outcomes. However, a broader look into the family environment which includes the quality of the bonds between family members, the existence of norms with regard to the availability and consumption of different foods and with regard to the practice of physical activity has demonstrated the influence of the family context on the dietary habits, physical activity practice and weight status of children and youth, which support other studies, although the family environment do not necessarily has been studied in terms of social capital (Davison & Birch, 2001; Hendrie, Sohonpal, Lange, & Golley, 2013; Savage et al., 2008).

For adolescents in our sample, family constitutes the main source of social capital with regard to lifestyle and dietary habits. At the same time, study 2 shows that the use that they make of the health assets that this social capital provides with regard to healthy eating is mostly done from a passive position in which they delegate the responsibility of their health to their family, more specifically to their parents. On the contrary, they adopt a much more proactive role in relation to physical activity, the use of technologies and the consumption of tobacco and alcohol. As also study 2 points out, a possible explanation to these differences might be the low importance that adolescents give to their diet.

Within the family domain, the different subconstructs of social capital are associated heterogeneously with the different health indicators we have studied in our research. *Social interaction* is a key component of social capital, in the sense that it enables the existence of all the other dimensions. The social and technological changes occurred in the last decades have opened new ways of interaction. Nowadays, unlike the time when Coleman wrote his seminal work (1998, 1990), in which physical presence was the main means to interact with others, cellphones, internet and other technologies allow a very fluid communication between people without requiring sharing the same space. In our study, almost all the adolescents had relatives and/or friends in other parts of Spain or other countries, and in some of the cases these people were identified as being within the most important ones for our participant. However, it is clear that the health assets that these connections will enable to mobilize will be influenced by distance. For example, while providing social support and the existence of feelings of belonging can be feasible over long distances, informal control and norms do not seem so present without physical interaction.

In relation to the structural dimension of social capital, beyond social interaction, *shared norms and values* also showed significant correlations with dietary habits, toxic habits, RUTL and BMI in study 1. In this case, norms regarding different aspects of health were associated with better health behaviors in our sample.

Sense of belonging and the perception of *collective efficacy* are the subconstructs of family social capital that showed more associations with the different health outcomes in our research. Both of them were related to the dependent variables of our study, except for BMI which was only correlated to collective efficacy. To our knowledge, studies on social capital and health in adolescents that have considered collective efficacy as a dimension of social capital have only measured it at a community level and through parental perception. Notwithstanding these limitations, it has been related to a lower probability to develop obesity (Cohen et al., 2006; Singh,

Kogan, Siahpush, & van Dyck, 2008). On the contrary, family sense of belonging has been included in several studies such as the ones reported by Morgan (2011), where it showed a possible protective effect with regard to dietary behaviors, toxic substances consumption and life satisfaction. As Morgan itself and other authors indicate, the main mechanism through which this association would happen is related to a sound and secure attachment (Berkman & Krishna, 2014; Lerner, Bornstein, & Leventhal, 2015). Additionally, study 2 of our investigation suggest that a stronger sense of belonging could favor social interaction among the members of a group (not only family-related) as well as the existence of informal control through the presence of shared norms and values. In agreement with Portes and Landolt (2002) when highlight the downsize of social capital, however, this fact does not necessarily entails health advantages. In fact, we have seen how alcohol and tobacco consumption is normally done while interacting with friends.

Negative social support in the family domain, in turn, was inversely correlated to SRH, RUTL and toxic habits in study 1. There are not published studies on negative social support in the family domain and adolescents' health that we are aware of. However, researches such as the ones by Li & Delva (2011, 2012) or Litwin (2011) show a negative association of this dimension of social capital in adults. Study 2 results' suggest that, in effect, the perception of hostility might favor the development of unhealthy behaviors. Given the fact that some of the questions through which we have assessed negative social support were related to excessively demanding relationship among family members, a possible explanation to this relationship could involve the perception norms and values as being too rigid.

Last, with regard to the association of the different subconstructs of family social capital with each one of the items of the KIDMED index varies widely. Again, sense of belonging and the existence of shared norms and values are the dimensions more correlated to the different items assessing adherence to the Mediterranean Diet. Nevertheless, neither study 1 nor study 2 suggest any clear pattern on how these relationships would be stablished.

4. Other relevant variables influencing the lifestyle, dietary habits and weight status in a sample of Catalan adolescents from different socioeconomic contexts.

Question 1.4 *Are there other relevant variables that influence the lifestyle, dietary habits and weight status of a sample of Catalan adolescents from different socioeconomic contexts?* not only enrich the analysis of the phenomenon of lifestyle, eating habits and weight status of adolescents through the perspective of social determinants that we use in our research, but it also points

towards other elements that might confer an added value to public health actions. In our investigation, this question is primarily answered by study 2. However, the impossibility to develop logistic regressions for most of the dependent variables in study 1, along with the fact that the logistic models that have been successfully developed only includes two of the possible predictive variables in our research, indicates that it is necessary to identify other factors that allow to improve the explicative models to better understand the lifestyle, dietary habits and weight status of the adolescents in our sample.

One of the interesting aspects of this research is the fact that gender has arisen as the most influential sociodemographic variable, even above SES, autochthonous or immigrant parental origin or living in a rural or urban context. This way, while males in our sample were more likely to be overweight or obese, being female increased the chances to report bad SRH by 2.3. The role of gender as an axis of social inequalities in health has been widely described (Kelly, 2009; Phillips, 2011; WHO Regional Office Europe, 2013). Thus the novelty in this dissertation is not so much the relationship of gender and health outcomes, but the confirmation that this variable has not yet been effectively tackled in public health.

Additionally, our research has allowed to observe the different motivations that adolescents of our sample had when making health-related choices. In front of the scarce consideration of health when making dietary choices, factors such as convenience, taste or having fun have a much determining influence. Public health actions intending to improve adolescent health will need to develop actions that foster the interest of adolescent in adopting a more proactive role towards their health.

In summary, our results support the notion that if current trends in youth obesity and its related behaviors are to be reverted it is necessary to develop actions that move beyond individual behavior and its more stablished determinants and finally take other spheres into account (Fundacion Española de Nutrición, 2013; Gortmaker et al., 2011; Kawachi, 2014; Kumanyika et al., 2013; Swinburn et al., 2011). Although more research is needed, the family domain seems to offer great opportunities to improve adolescent health through coordinated actions that also involve social actions.

Final Conclusions and Future Research

This thesis provides some evidence of the links between social capital and lifestyle and dietary habits in a sample of Catalan adolescents from different socioeconomic contexts. Our results support the fact that the social capital in the different domains included in this research (family, peers, school, and community) displays different characteristics and influence health in different ways. There is also evidence that **the different constructs of social capital included in this study act separately in promoting healthy lifestyles and behaviors**. A processual lifecourse approach could help clarifying the relationship between social capital and BMI in adolescent population.

Higher levels of social capital in the family environment are the most protective factor for the health outcomes included in this study, which even outplace socioeconomic status as a predictor of a healthy lifestyle, dietary habits and weight status in the adolescents in our sample. Notwithstanding this observation, though, the association of socioeconomic status and eating behaviors remain consistent and it is especially evident with regard to the maintenance of unhealthy habits such as fast food consumption, skipping breakfast or eating unhealthy foods in this meal. Although the importance of the school and community environments is more discrete, further research needs to be done to explore how these context can cooperate in promoting adolescent health.

The influence of the peers is much stronger in relation to physical activity, technological leisure and toxic habits than it is with regard to eating behaviors. The fact that adolescents commend the responsibility of their diet to their parents, along with the scarce importance that health has when they make food choices may lay behind this observation.

With regard to the conceptualization and operationalization of social capital in Public Health, **both the social cohesion and the social networks approaches to social capital are complementary and necessary to fully understand social capital and its relationship with health outcomes.** The distinction of these two approaches in the different domains allows to better comprehend the pathways through which being part of different social groups influences health.

There is consistent evidence that the study of the family context from a social capital approach can make a contribution in promoting adolescents' health. In this direction, the development and validation of an instrument to assess family social capital in a reliable manner is an added value to this dissertation. The application of such tools (not only with regard to the family environment) in different cultural context should also allow to detangle the influence of socio-political and cultural aspects.

This research adds a new piece of evidence on the need of introducing a **gender perspective** in the health actions addressed to adolescents. In the same way, **youth's motivations** to make health-related choices need to be taken into account in order to develop effective actions to promote healthy lifestyles and eating behaviors.

Last, **our results support the need of including social action as a strategy to improve the lifestyle and dietary habits of adolescents.**

Strengths, limitations and Future Research

The use of a mixed-method approach is a unique strength of this dissertation. While the cross-sectional study has allowed to establish some significant correlations between social capital, health-related and sociodemographic variables, the multiple case study has provided valuable data about the meaning, relevance and impact that different elements of the youth's social environment have in their lifestyle and dietary habits. In this sense, one of the distinctive traits of this dissertation is the fact of investigating the pathways through which social capital is associated to health outcomes in adolescents. Moreover, it addresses almost unexplored questions in social capital research such as its relation with nutrition.

Each one of the interviews that have been conducted has suggested supplementary questions that, in order to stick to our research objectives we did not explore further. These elements are related to psychosocial features such as self-esteem, self-concept and the perception of body image, how these are influenced by the different groups' social capital and how they influence lifestyle and dietary habits.

Furthermore, the conceptualization of social capital within the family domain and the development and validation of an instrument to assess adolescent family social capital is an additional asset of this dissertation. Further work in this direction includes the refinement of this tool and its use in other cultural contexts with the aim to establish cross-cultural comparisons. Additionally, the adaptation of this questionnaire to other population segments would open new research opportunities.

The limitations of this research are related in the first place, to the design and the sampling strategy that have been used. While one of the strengths of this dissertation is the choice of a mixed-methods approach that has allowed to deepen in the links of social capital and the selected

health-outcomes, the use of a purposeful sampling strategy limits the possibility of generalizing these results. Moreover, selecting the sample from only one high-school in each of the four contexts entails that specific common characteristics of the reality that all the students in each center share may have influenced the results. These facts can underlie the non-significant association of socioeconomic status and other sociodemographic variables with most of the health outcomes included in our investigation.

In order to advance social capital research in relation to adolescent lifestyle and dietary habits, three main areas of research areas could be pursued. First, testing the universality of the results of this dissertation by extending the empiric work through a subsequent cross-sectional study with a randomized representative sample and by including the findings of the multiple case study. Second, more research exploring the relationship between social capital and other social determinants such as (but not only) SES and gender might provide a more in-depth understanding of health inequalities in these domains. Last, further investigation on how the different social domains (family, school, community and peers) at the local level and inter-related might offer possible clues to improve health promotion actions in adolescents.

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Appendices

14. Appendix A: Contact email to the direction board of the schools participating in this research (in Catalan).

Benvolgut _____,

El meu nom és Elena Carrillo i sóc estudiant de doctorat a la Facultat de Psicologia i Ciències de l'Educació i l'Esport Blanquerna, de la Universitat Ramon Llull.

El motiu d'aquest correu és sol·licitar-li la col·laboració del centre que dirigeix en una recerca que estem duent a terme des del grup de recerca en Pedagogia, Societat i Innovació amb el suport de les TIC, dirigit pel Dr. Jordi Riera. Aquesta recerca constitueix la meva tesi doctoral, la qual versa sobre els efectes del capital social com a generador de desigualtats en estil de vida i obesitat en adolescents. El que estem investigant és com diferents elements de l'entorn condicionen l'estil de vida i la probabilitat de patir excés de pes en adolescents, i dins d'aquests elements, tenim un interès especial en les relacions socials. En aquest context, estem desenvolupant un qüestionari que ens permeti valorar de manera objectiva les relacions en l'entorn familiar.

Per poder *validar* aquest qüestionari busquem centres educatius situats en barris de diferent perfil socioeconòmic on puguem accedir a adolescents de 3r o 4t d'ESO, i atès que el seu centre compleix amb els criteris d'inclusió que perseguim, voldríem sol·licitar la vostra col·laboració.

La col·laboració és concreta en dues qüestions: d'una banda la realització d'un grup de discussió amb 8-10 alumnes de 4t d'ESO per validar un qüestionari sobre el seu entorn familiar. L'objectiu d'aquest grup de discussió és comprovar que les preguntes que hem formulat són adequades i comprensibles pels adolescents. Jo mateixa em desplaçaria a fer-lo i tindria una durada aproximada de 30 minuts. Es podria fer perfectament durant l'hora d'esbarjo, si ho considereu apropiat.

En segon lloc, l'aplicació d'aquest qüestionari a 30 alumnes de 4t d'ESO i els seus pares. Es tracta d'un qüestionari breu que es respon en 10-15 minuts. Jo també podria venir a fer la explicació als alumnes i passar-lo, i prèviament us faria arribar la documentació per als pares, que consisteix en el mateix qüestionari, més una carta de presentació i l'autorització per a que els seus fills hi puguin participar. Evidentment, totes les dades seran codificades i tractades d'acord amb la llei de protecció de dades.

Finalment, l'informem que els alumnes i famílies que ho desitgin podran indicar la seva disposició a ésser contactats per participat en subseqüents fases d'aquesta recerca si compleixen amb els

criteris d'inclusió. Aquesta fase consistiria en entrevistes personalitzades als adolescents seleccionades, que, si fos possible, ens agradaria dur a terme al seu centre fora de l'horari lectiu per no interrompre la dinàmica del centre.

En qüestió de dates, el calendari amb el que estem treballant suposa realitzar el grup de discussió durant la primera quinzena de febrer, i aplicar els qüestionaris a finals de mes.

Quedo a la seva disposició per a qualsevol dubte o qüestió que pugui sorgir, així com per concretar més detalls si considereu oportú col·laborar en aquesta recerca. Em pot contactar a través d'aquesta mateixa adreça de correu electrònic o bé per telèfon al número XXXXXXXXX.

Salutacions cordials,

Elena Carrillo Álvarez

15. Appendix B. Final file handed out to the participants in study 1 (in Catalan/Spanish).

Cuestionario sobre capital social y estilo de vida

Este cuestionario forma parte de una investigación sobre el estilo de vida y la alimentación de los adolescentes. Dada la importancia del tema, tu instituto se ha prestado a colaborar formando parte de la muestra de estudio. La información descrita en este cuestionario será tratada con total CONFIDENCIALIDAD y todos los datos recogidos se analizarán globalmente junto a los aportados por centenares de estudiantes de diversas ciudades españolas. Queremos agradecer tu amabilidad y que dediques un poco de tu tiempo a ayudarnos aportando tus respuestas con sinceridad.

1. Curso actual: …….
2. Sexo: ☐ Masculino ☐ Femenino
3. Año de nacimiento: ……..
4. País de nacimiento: ……
5. Ciudad de residencia: ……
6. Número de años que llevas viviendo en esta ciudad: ……
7. País de nacimiento de tu:

   Padre: …….
   Madre: ……
8. Indica el nivel máximo de estudios de tus padres. (*Indícalo con una (X) donde corresponda).*

	Madre	Padre
1. Sin estudios, primer grado o EGB sin terminar		
2. Estudios de primaria terminados		
3. Bachillerato Superior incompleto o FP de 2on grado incompleto		
4. Bachillerato Superior/FP de 2on grado terminado		
5. Formación de tipo universitario incompleta		
6. Título universitario de grado medio terminado (diplomados, ingenieros técnicos)		
7. Título universitario de grado superior terminado (licenciados)		

9. ¿Cuánto mides? ……..cm.

10. ¿Cuánto pesas? ……..kg.

11. Ordena los siguientes grupos de alimentos *(1 el que comes con más frecuencia, 6 el que comes con menos frecuencia –no puede haber números repetidos).*

    ☐ a. Fruta, verdura
    ☐ b. Carnes rojas (cerdo, ternera), embutidos
    ☐ c. Pan, pasta, cereales, arroz, patatas
    ☐ d. Dulces, mantequilla
    ☐ e. Pollo, pescado, huevos
    ☐ f. Lácteos: yogur, queso, leche

12. ¿Cuánta actividad física **moderada** has hecho cada día de la semana pasada? (*Actividad física moderada es la que te permite hablar, pero con cierta dificultad cuando la realizas. Indica cuántos minutos has dedicado cada día marcando una (X) donde corresponda).*

	< 30min	30-60min	60-90min	90-120min	>120min
Lunes					
Martes					
Miércoles					
Jueves					
Viernes					
Sábado					
Domingo					

13. ¿Cuánta actividad física **intensa** has hecho cada día de la semana pasada? *(Actividad física intensa es la que, mientras la realizas, te costaría hablar seguido. Indica cuántos minutos has dedicado cada día marcando una (X) donde corresponda).*

	< 30min	30-60min	60-90min	90-120min	>120min
Lunes					
Martes					
Miércoles					
Jueves					
Viernes					
Sábado					
Domingo					

14. ¿Cuántas horas cada día estás conectado a internet (ordenador o móvil) para chatear o relacionarte con otras personas (redes sociales, WhatsApp, etc.)? (*Indica marcando una (X) donde corresponda).*

	< 30min	30-60min	60-90min	90-120min	>120min
Día no festivo					
Día festivo					

15. ¿Cuántas horas cada día estás jugando con el ordenador, móvil, consola, juegos online, o conectado a Internet para entretenerte (no para chatear ni relacionarte a través de las redes sociales)? (*Indica marcando una (X) donde corresponda).*

	< 30min	30-60min	60-90min	90-120min	>120min
Día no festivo					
Día festivo					

16. ¿Cuántos vasos de líquido (agua, zumos, leche, etc. NO REFRESCOS) bebes diariamente?
☐ Menos de 2 ☐ 3-5 ☐ 6-8 ☐ más de 8

17. ¿Cuántos refrescos con gas (Cola, naranjada, bebidas energéticas con gas, etc.) bebes en toda una semana [durante el curso escolar]?
☐ Menos de 2 ☐ 3-5 ☐ 6-8 ☐ más de 8

18. ¿Cuántos cigarrillos fumas cada día? (*Indícalo con una (X) donde corresponda).*

	Ninguno	1 - 10	11 – 20	21 – 30	> 30
Lunes a jueves					
Viernes a domingo					

19. De las siguientes bebidas alcohólicas, indica la cantidad que consumes *(la cantidad es el número resultante de sumar todas las jarras, copas, vasos, cubatas que hayas tomado en el periodo indicado).*

	Entre semana	Fin de semana
Cerveza, vino, cava, etc.		
Cubatas, ginebra, ron, whisky, ...		

20. Piensa en los últimos 12 meses, y responde cuántas veces has consumido las siguientes sustancias. (*Indícalo con una (X) donde corresponda).*

	> 1 vez/mes	<1 vez/mes	Nunca
Porros			
Otros tipos de drogas			

21. Pensando en el último mes, ¿cuántas horas has dormido cada noche, si al día siguiente tenías clase?

☐ Menos de 5 ☐ 5-6 ☐ 6 -7 ☐ 7-8 ☐ 8-9 ☐ Más de 9

22. Pensando en un día cualquiera, responde a las siguientes preguntas. (*Indicándolo con una (X) donde corresponda)*

	Nunca	No cada día	1 vez/día	2 veces/día	3 veces/día	>3veces/día
¿Cuántas veces te lavas los dientes?						
¿Cuántas veces te lavas las manos con agua y jabón?						

23. En general, ¿cómo dirías que es tu salud?

☐ Excelente ☐ Muy buena ☐ Buena ☐ Regular ☐ Mala

24. Marca con una cruz según corresponda.

	Sí	No
Tomo una fruta o un zumo natural todos los días.		
Tomo una 2ª pieza de fruta todos los días.		
Tomo verduras frescas (ensaladas) o cocinadas regularmente una vez al día.		
Tomo verduras frescas o cocinadas de forma regular más de una vez al día.		
Consumo pescado con regularidad (por lo menos 2-3 veces al a semana).		
Acudo una vez o mas a la semana a un centro de comida rápida (fast food) tipo hamburguesería.		
Tomo legumbres más de una vez por semana		
Tomo pasta o arroz casi a diario (5 dias o más a la semana)		
Desayuno un cereal o derivado (pan, etc)		
Tomo frutos secos con regularidad (al menos 2-3 veces a la semana).		
Se utiliza aceite de oliva en casa.		
No desayuno		
Desayuno un lácteo (yogurt, leche, etc).		
Desayuna bollería industrial, galletas o pastelitos.		
Toma 2 yogures y/o 40 g queso cada día.		
Toma golosinas y/o caramelos varias veces al día		

A continuación se presentan una serie de preguntas sobre los miembros de tu familia y tu relación con ellos. Por favor, marca con una (X) la respuesta más adecuada en cada pregunta, o indica la información requerida.

1. Además de ti, ¿cuántos miembros de tu familia viven en tu hogar?

Si vives manera alternada entre dos hogares, suma las personas que viven en ellos y marca la casilla indicada.

[ ] Ninguna
[ ] 1
[ ] 2 [ ] Vivo en dos hogares
[ ] 3
[ ] 4-6
[ ] Más de 6.

2. Indica cuál es tu parentesco con ellas. Marca todas las Casillas aplicables en tu caso:

[ ] Madre [ ] Padre [ ] Hermanos/as [ ] Abuelos/as

[ ] Pareja de la madre [ ] Pareja del padre [ ] Otros familiares

3. ¿Con cuántas de ellas sientes que tienes una relación cercana y de confianza?

[ ] Ninguna
[ ] 1
[ ] 2
[ ] 3
[ ] 4-6
[ ] Más de 6

4. ¿Cuál es el número de personas de tu familia que viven fuera de tu hogar?

[ ] Ninguna
[ ] 1-2
[ ] 3-5
[ ] 6-10
[ ] 10 -30
[ ] Más de 30

5. Indica cuál es tu parentesco con ellas. Marca todas las casillas que se apliquen en tu caso.

[ ] Abuelos/as [ ] Tíos/as [ ] Primos/as [ ] Hermanos/as [ ] Madre/Padre

[ ] Pareja madre/padre [ ] Tíos/as segundos [ ] Primos/as segundos

[ ] Otros (indicar cuál/es) _____

6. ¿Con cuántas de ellas sientes que tienes una relación cercana y de confianza?

[ ] Ninguna
[ ] 1-2
[ ] 3-5
[ ] 6-9
[ ] 10 -20
[ ] Más de 20

7. ¿Con qué frecuencia haces las siguientes actividades con miembros de tu familia que viven en tu hogar?

	Nunca	Casi nunca	Menos de una vez al mes	Más de una vez al mes	Una vez a la semana	Más de una vez a la semana
7.1. Dar un paseo, ir al cine, ir a un concierto, ver deportes, ir a un museo, ir al teatro, ir de picnic, ir a comer fuera.						
7.2. Jugar, leer, escuchar música.						
7.3. Practicar deporte.						
7.4. Hacer la compra.						
7.5. Preparar la comida.						
7.6. Comer juntos.						
7.7. Realizar tareas domésticas.						
7.8. Hacer deberes u otras tareas de la escuela						
7.9. Hablar tranquilamente						
7.10. Visitar a otros familiares, o recibir visitas de ellos.						

8. ¿Con qué frecuencia haces las siguientes actividades con miembros de tu familia que viven fuera de tu hogar?

	Nunca	Casi nunca	Menos de una vez al mes	Más de una vez al mes	Una vez a la semana	Más de una vez a la semana
8.1. Dar un paseo, ir al cine, ir a un concierto, ver deportes, ir a un museo, ir al teatro, ir de picnic, ir a comer fuera.						
8.2. Jugar, leer, escuchar música						
8.3. Practicar deporte						
8.4. Hacer la compra.						
8.5. Preparar la comida						
8.6. Comer juntos.						
8.7. Hablar tranquilamente						
8.8. Hablar con ellos por teléfono						

9. ¿Entre los miembros de tu familia que viven fuera de tu hogar , hay personas con las siguientes características?
En caso afirmativo, indica si has mantenido contacto con ellos en el último mes.

	No	Sí	¿Has mantenido contacto con ellos en el último mes?	
			No	Sí
9.1. de nacionalidades diferentes a las de los miembros de tu hogar?				
9.2. con un nivel de estudios inferior a la máxima titulación completada por alguno de los miembros de tu hogar?				
9.3. con un nivel de estudios superior a la máxima titulación completada por alguno de los miembros de tu hogar?				
9.4. que trabajan en profesiones tales como *personal de limpieza, transportista, trabajador de la construcción, conserjes, etc.*				
9.5. que trabajan en profesiones como *peluquero, mecánico, cocinero, camarero o similar.*				
9.6. que trabajan en profesiones tales como *comercial, recepcionista, ganadero, agricultor, policía local, propietario de una empresa de pintura, electricidad, fontanería, o similar.*				
9.7. que trabajan en profesiones tales como *enfermero, maestro, administrativo, contable, escritor, artista, deportista, directivos de empresas con menos de 10 trabajadores o similar.*				
9.8. que trabajan en profesiones tales como *médico, abogado, dentista, profesor de instituto, veterinario, banquero, policía nacional o autonómico, directivo de una gran empresa o similar.*				
9.9. con creencias religiosas diferentes a las de los miembros de tu hogar?				
9.10. con orientación política diferente a la de los miembros de tu hogar?				
9.11. con más coches que los miembros de tu hogar?				
9.12. con menos coches que los miembros de tu hogar?				
9.13. que suelen salir de vacaciones más veces que los miembros de tu hogar?				
9.14. que suelen salir de vacaciones menos veces que los miembros de tu hogar?				

10. ¿Hay, en tu hogar, normas sobre…

	No	Sí
10.1. …la hora de acostarse?		
10.2. …el tiempo que dedicamos a ver la televisión, jugar a los videojuegos, usar el ordenador, etc.		
10.3. …la hora de llegar a casa.		
10.4. …el consumo de bebidas alcohólicas.		
10.5. …el consumo de tabaco.		
10.6. …el tipo de comida o momento en que comemos.		
10.7. … la participación en las tareas del hogar.		

11. ¿Con qué frecuencia se dan las siguientes situaciones en relación a los miembros de tu familia que viven en tu hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
11.1. Funcionamos bien como familia.						
11.2. Si hay un problema, actuamos colectivamente y cooperamos para solucionarlo.						
11.3. Puedo contar con mi familia cuando necesito apoyo o ayuda con problemas serios o decisiones importantes.						
11.4. En nuestra familia es importante seguir las normas.						

12. ¿Con qué frecuencia se dan las siguientes situaciones en relación a los miembros de tu familia que viven fuera de tu hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
12.1. Funcionamos bien como familia.						
12.2. Si hay un problema, actuamos colectivamente y cooperamos para solucionarlo.						
12.3. Puedo contar con mi familia cuando necesito apoyo o ayuda con problemas serios.						
12.4. En nuestra familia es importante seguir las normas.						

13. ¿Con qué frecuencia se dan las siguientes situaciones entre los miembros de tu familia que viven en tu mismo hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
13.1. Las personas hacen demasiadas demandas las unas a las otras.						
13.2. Los propósitos o metas personales están en conflicto con los de la familia.						
13.3. Hay discusiones o peleas entre miembros de la familia						
13.4. Hay críticas entre miembros de la familia						

14. ¿Con qué frecuencia se dan las siguientes situaciones entre los miembros de tu familia que viven fuera de tu hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
14.1. Las personas hacen demasiadas demandas las unas a las otras.						
14.2. Los propósitos o metas personales están en conflicto con los de la familia.						
14.3. Discusiones o peleas entre miembros de la familia						
14.4. Críticas entre miembros de la familia						

15. En general, ¿Cuál es tu grado de acuerdo con las siguientes afirmaciones?

	Completa-mente en desacuerdo	En desacuerdo	Ni de acuerdo ni desacuerdo	En acuerdo	Totalmente de acuerdo
15.1. Siento que mi familia me entiende y me apoya.					
15.2. En mi pueblo o barrio las personas confían las unas en las otras.					
15.3. En mi pueblo o barrio, los vecinos intervienen cuando alguien tiene un mal comportamiento.					
15.4. En mi escuela, hay confianza entre profesores y alumnos.					
15.5. En mi escuela, hay confianza entre los alumnos.					
15.6. En mi escuela, los alumnos colaboran los unos con los otros.					

¡Muchas gracias por tu colaboración!

16. Appendix D. Final version of the Family Social Capital Questionnaire (in Spanish).

Cuestionario sobre capital social familiar

A continuación se presentan una serie de preguntas sobre los miembros de tu familia y tu relación con ellos. Por favor, marca con una (X) la respuesta más adecuada en cada pregunta, o indica la información requerida.

1. Además de ti, ¿cuántos miembros de tu familia viven en tu hogar? **Si vives manera alternada entre dos hogares, suma las personas que viven en ellos y marca la casilla indicada.**

[ ] Ninguna
[ ] 1
[ ] 2 [ ] Vivo en dos hogares
[ ] 3
[ ] 4-6
[ ] Más de 6.

2. ¿Cuál es tu parentesco con cada uno de ellos? Escribe en cada línea las diferentes relaciones de parentesco que mantienes con ellos, y, si es necesario, indica entre paréntesis el número de miembros con qué mantienes ese parentesco.
Por ejemplo: Si vives con tu padre, tu madre y dos hermanos, escribe: "1.padre, 2. Madre, 3. Hermano (2)"

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____

3. ¿Con cuántas de ellas sientes que tienes una relación cercana y de confianza?

[ ] Ninguna
[ ] 1
[ ] 2
[ ] 3
[ ] 4-6
[ ] Más de 6

4. ¿Cuál es el número de personas de tu familia que viven fuera de tu hogar?

[ ] Ninguna
[ ] 1-2
[ ] 3-5
[ ] 6-10
[ ] 10 -30
[ ] Más de 30

5. ¿Cuál es tu parentesco con cada uno de ellos? Escribe en cada línea las diferentes relaciones de parentesco que mantienes con ellos, y, si es necesario, indica entre paréntesis el número de miembros con qué mantienes ese parentesco.

Por ejemplo: "1.abuela, 2.primo/a (3), 3.tío/a (2)."

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____
13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____
19. _____ 20. _____ 21. _____ 22. _____ 23. _____ 24. _____
25. _____ 26. _____ 27. _____ 28. _____ 29. _____ 30. _____

6. ¿Con cuántas de ellas sientes que tienes una relación cercana y de confianza?

[ ] Ninguna
[ ] 1-2
[ ] 3-5
[ ] 6-9
[ ] 10 -20
[ ] Más de 20

7. ¿Con qué frecuencia haces las siguientes actividades con miembros de tu familia que <u>viven en tu hogar</u>?

	Nunca	Casi nunca	Menos de una vez al mes	Más de una vez al mes	Una vez a la semana	Más de una vez a la semana
7.1. Dar un paseo, ir al cine, ir a un concierto, ver deportes, ir a un museo, ir al teatro, ir de picnic, ir a comer fuera.						
7.2. Jugar, leer, escuchar música.						
7.3. Practicar deporte.						
7.4. Hacer la compra.						
7.5. Preparar la comida.						
7.6. Comer juntos.						
7.7. Realizar tareas domésticas.						
7.8. Hacer deberes u otras tareas de la escuela						
7.9. Hablar tranquilamente						
7.10. Visitar a otros familiares, o recibir visitas de ellos.						

8. ¿Con qué frecuencia haces las siguientes actividades con miembros de tu familia que viven fuera de tu hogar?

	Nunca	Casi nunca	Menos de una vez al mes	Más de una vez al mes	Una vez a la semana	Más de una vez a la semana
8.1. Dar un paseo, ir al cine, ir a un concierto, ver deportes, ir a un museo, ir al teatro, ir de picnic, ir a comer fuera.						
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8.6. Comer juntos.						
8.7. Hablar tranquilamente						
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9. ¿Entre los miembros de tu familia que viven fuera de tu hogar , hay personas con las siguientes características?
En caso afirmativo, indica si has mantenido contacto con ellos en el último mes.

	No	Sí	¿Has mantenido contacto con ellos en el último mes?	
			No	Sí
9.1. de nacionalidades diferentes a las de los miembros de tu hogar?				
9.2. con un nivel de estudios inferior a la máxima titulación completada por alguno de los miembros de tu hogar?				
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9.8. que trabajan en profesiones tales como *médico, abogado, dentista, profesor de instituto, veterinario, banquero, policía nacional o autonómico, directivo de una gran empresa o similar.*				
9.9. con creencias religiosas diferentes a las de los miembros de tu hogar?				
9.10. con orientación política diferente a la de los miembros de tu hogar?				
9.11. con más coches que los miembros de tu hogar?				
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9.13. que suelen salir de vacaciones más veces que los miembros de tu hogar?				
9.14. que suelen salir de vacaciones menos veces que los miembros de tu hogar?				

10. ¿Hay, <u>en tu hogar,</u> normas sobre…

	No	Sí
10.1. …la hora de acostarse?		
10.2. …el tiempo que dedicamos a ver la televisión, jugar a los videojuegos, usar el ordenador, etc.		
10.3. …la hora de llegar a casa.		
10.4. …el consumo de bebidas alcohólicas.		
10.5. …el consumo de tabaco.		
10.6. …el tipo de comida o momento en que comemos.		
10.7. … la participación en las tareas del hogar.		

11. ¿Con qué frecuencia se dan las siguientes situaciones en relación a los miembros de tu familia que <u>viven en tu hogar</u>?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
11.1. Funcionamos bien como familia.						
11.2. Si hay un problema, actuamos colectivamente y cooperamos para solucionarlo.						
11.3. Puedo contar con mi familia cuando necesito apoyo o ayuda con problemas serios o decisiones importantes.						
11.4. En nuestra familia es importante seguir las normas.						

12. ¿Con qué frecuencia se dan las siguientes situaciones en relación a los miembros de tu familia que viven fuera de tu hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
12.1. Funcionamos bien como familia.						
12.2. Si hay un problema, actuamos colectivamente y cooperamos para solucionarlo.						
12.3. Puedo contar con mi familia cuando necesito apoyo o ayuda con problemas serios.						
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13. ¿Con qué frecuencia se dan las siguientes situaciones entre los miembros de tu familia que viven en tu mismo hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
13.1. Las personas hacen demasiadas demandas las unas a las otras.						
13.2. Los propósitos o metas personales están en conflicto con los de la familia.						
13.3. Hay discusiones o peleas entre miembros de la familia						
13.4. Hay críticas entre miembros de la familia						

14. ¿Con qué frecuencia se dan las siguientes situaciones entre los miembros de tu familia que viven fuera de tu hogar?

	Nunca	Esporádi-camente	A veces	A menudo	Muy a menudo	Todo el tiempo
14.1. Las personas hacen demasiadas demandas las unas a las otras.						
14.2. Los propósitos o metas personales están en conflicto con los de la familia.						
14.3. Discusiones o peleas entre miembros de la familia						
14.4. Críticas entre miembros de la familia						

¡Muchas gracias por tu colaboración!

Universitat Ramon Llull

Aquesta Tesi Doctoral ha estat defensada el dia ____ d _____ de 20

al Centre _____

de la Universitat Ramon Llull

davant el Tribunal format pels Doctors sotasignants, havent obtingut la qualificació:

President/a

_____

Vocal

_____

Secretari/ària

_____

Doctorand/a

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