Examining the link between socio-economic position and mental health in early adolescents
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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2009

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

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‘An imbalance between the rich and poor is the oldest and most fatal ailment of all republics’

Plutarch (AD 46-122)

Greek historian, biographer, and essayist
INTRODUCTION

Epidemiological data estimate the worldwide one-year prevalence of child and adolescent mental disorders at approximately 23% (WHO, 2005). In the Netherlands, approximately 20% of boys and 23% of girls are reported to have had an emotional and/or behavioral disorder in the previous six months (Vollebergh, Van Dorsselaer, Monshouwer, Verdurmen, Van der Ende, & Ter Boght, 2006; Schneiders, Drukker, Van der Ende, Verhulst, Van Os, Nicolson, 2003). Mental health, especially during adolescence, is fundamental to good quality of life and contributes to future success in society. Healthy and confident children are more likely to turn out into healthy, confident and productive adults, who in turn contribute to the health and well-being of their societies (Rao, 2001). In childhood and adolescence, difficulties associated with mental health such as functional impairment, poor performance in school, substance and drug abuse, and conflicts with authority can impede upward social mobility (Miech, Caspi, Moffit, Wright, & Silva, 1999; Link, Lennon, & Dohrendwend, 1993; Due, Lynch, Holstein, & Modvig, 2003) and may eventually lead to a low socio-economic position (SEP). For example, children may drop out of school or have truncated education due to mental health problems.

Mental health problems in children and adolescents tend to persist into adulthood (Kessler, Bergland, Demler, Jin, Merikangas, & Walters, 2005; Costello, Foley, Angold, 2006; WHO, 2005; Visser, Van der Ende, Koot, & Verhulst, 2000; Hofstra, Van de Ende, & Verhulst, 2001). About 50% of mental disorders in adults are known to begin before the age of 14 (WHO, 2008). Because of the continuum with adult mental disorders, childhood and adolescent mental health problems form a major public health problem. Consequently, research on determinants of mental health and disorders in childhood and adolescence can contribute to understanding of and interventions aimed at preventing disorders not only during childhood and adolescence but in adulthood as well.

Biological, individual, environmental, and family characteristics all contribute to differences in mental health (European Commission, 2005; WHO, 2003). Particularly in childhood and early adolescence, family characteristics such as socio-economic position (SEP) may influence mental health because of the important role of the family in the immediate social environment at this developmental stage. In childhood and early-adolescence, parental SEP is the most informative socio-economic measure because the children and adolescents have not yet acquired their own individual SEP. Although family SEP is associated with offspring mental health, the link remains poorly understood.

The main goal of this thesis is to address the link between family SEP and mental health problems in early adolescents. The aims were four-fold: (1) to explore whether the links were specific to particular domains of mental health problems (i.e. internalizing versus externalizing problems), (2)
to study the mediation of these links by different types of life stressors (environment-related versus person-related), (3) to investigate the synergistic effects of family SEP and familial psychopathology on offspring mental health, and (4) to assess whether family SEP and symptoms of mental health problems independently predict the use of specialty mental health services.

In this introductory chapter, the concept of SEP, the link between SEP and different dimensions of mental health problems, and the challenges of researching the link between SEP and mental health are described. At the end of the chapter, the aims of the current thesis are outlined in more detail and a brief description of the TRAILS research project, in which this thesis is embedded, is given.

The concept of socio-economic position (SEP)

Socio-economic position has been defined as “the relative position of a family or individual on a hierarchical social structure, based on their access to or control over wealth, prestige and power” (Mueller and Parcel, 1981). Miech and Hauser (2001) broadened this definition to a concept that refers to “the placement of persons, families, households and census tracts or other aggregates with respect to the capacity to create or consume goods that are valued in our society.” Both definitions underscore the view of SEP as a multidimensional construct comprising diverse indicators related to economic resources, power, and/or prestige (Braveman, Cubbin, Egerter, et al., 2005).

The multidimensionality of SEP and related measurement issues make it a difficult concept to unravel. First, different measures of SEP such as income, education, and occupation (Bradley, Corwyn, 2002; Ensminger, Fothergill, 2003) are commonly used in contemporary research. Mostly derived from employment, income is associated with material well-being and ability to consume goods and services required for a healthy life. Occupation is related to status and power and also an indicator of working conditions and health. Education represents knowledge and skills, attitudes, and values that can shape health-related behaviors (Conger, Donnellan, 2007; Lahelma, Laaksonen, et al., 2006). Education, income, and occupation are positively correlated (Ensminger, Fothergill, 2003). Second, the different indices of SEP show different levels of stability across time and may predict family processes differently (Duncan, Magnuson, 2003; Ensminger, Fothergill, 2003; Kuh, Ben-Shlomo, 1997). More specifically, education is reported to be more stable than occupation or income (Shavers, 2007). Third, there may be interrelationships in the pathways between and among measures of SEP in relation to outcomes (Lahelma, Laaksonen, Martikainen, Rahkonen, Sarlio-Lahteenkorva, 2006). Full time employment, for example, may promote health through economic well-being resulting from income accrued from the employment. Fourth, the nature and time sequence may be different for different indicators of SEP (Lahelma, Laaksonen,
Martikainen, Rahkonen, Sarlio-Lahteenkorva, 2006). For example, low parental educational status may result in a decreased health-related quality of life for offspring, and subsequently, reduced access to material goods may lead to a lower health-related quality of life for the offspring (Rueden, Gosch, Rajmil, Bisegger, Ravens-Sieberer, 2006). Lastly, the effects of low SEP-related physical, material, social, and psychological adversities may act cumulatively during the life course (Kuh, Ben-Shlomo, 1997; Mheen van de, Stronks, Mackenbach, 1998).

Using an overall index of SEP may provide insights into the overall socio-economic disadvantage of the family. Aggregate measures of SEP can also provide complementary information on exposure of children and early adolescents to social conditions such as violence or environmental hazards and access to leisure activities in a family. However, this view is not without limitations: although individual measures of SEP may be correlated with each other, they are not interchangeable because they may be linked to different etiological mechanisms (Geyer, Hemstrom, Peter, Vagero, 2006; Shavers, 2007; Araya, Lewis, Rojas, Fritsch, 2003). This thesis aimed to capture the overall SEP of the family and sought to use aggregate measure of SEP that would robustly provide complementary information on the global social conditions of children and adolescents in the family context.

The link between family SEP and mental health problems

Already in 1855, the epidemiologist Edward Jarvis implicated low SEP in the prevalence of psychiatric disorders in his seminal work *Insanity and Idiocy in Massachusetts* (Jarvis, 1855). Jarvis reported that, compared to those in the upper class, the poor were 64 times more likely to experience insanity. Today, almost two centuries after Jarvis, substantial evidence has accrued that low SEP is associated with increased occurrence of psychiatric disorders among children, adolescents, and adults (Costello, Angold, Burns, 1996; Kessler, Foster, Saunders, Stang, 1995; Robins, Regier, 1991; Dohrenwend, Levava, Shroot, et al. 1992). Studying the influence of family SEP on child and adolescent mental health is vital, since the family is a conduit for SEP influences on offspring mental health (Rowe & Rodgers, 1997; Repetti, Taylor, Seeman, 2002).

Several mechanisms may be involved in the association between SEP and mental ill-health as indicators such as income, occupation or education do not directly cause mental ill-health. The indicators may be markers of more proximal risk factors, mediators, and moderators (Essex, Kraemer, Armstrong, et al., 2006; Felner, Brand, Dubois, Adan, Mulhall, Evans, 1995), among which are behavioral factors, material and structural inequities, and psychological stress (Mackenbach, Mheen van de, Stronks, 1994; Davey Smith, Bartley, Blane, 1994). Specific behavioral factors include poor parenting, child abuse and poor help-seeking in case of mental problems (Bolger, Patterson, Thompson, Kupersmidt, 1995; Bradley and Corwyn, 2002; Costello,
Compton, Keeler, Angold, 2003; McLeod, Shanahan, 1993; McLoyd, 1998; Caspi, Taylor, Moffit, Plomin, 2000; Schneider, et al., 2003; Zwaanswijk, Verhaak, Bensing, Van der Ende, Verhulst, 2003). Material and structural inequities include poor housing, residing in neighborhoods fraught with substance abuse and delinquent peers (Reijneveld, Brugman, Verhulst, Verloove-Vanhorick, 2005; Schneider, Drukker, Van der Ende, Verhulst, Van Os, Nicolson, 2003; Reijnneveld, Schene, 1998), and poor access to health services (Zahner, Pawelkiewicz, DeFrancesco, Adnopoz, 1992; John, Offord, Boyle, Racine, 1995). Chronic psychological stress resulting from low SEP may be associated with a high exposure to life stressors (Evans, 2004; Grant, Compas, Thurm, et al. 2006), and impact on the relationship between parents and their children, for instance through parental negativity and low emotional warmth (Feinberg, Button, Neiderhiser, Reiss, Hetherington, 2007). In addition, family SEP may provide environmental context that can modify the influence of other risk factors such as temperament (Gallo, Matthews, 2003; Pulkki, Elovainio, Viikari, Keltikangas-Jarvinen, 2003; Harper, Lynch, Wan-Ling, et al., 2002) and familial psychopathology (Fendrich, Warner, Weissman 1990; Tuvblad, Grann, Lichtenstein, 2006).

Aims and Outline

Previous research on the association of SEP with mental health has been hampered by some important limitations, which have produced a fragmentary corpus of evidence. As a result, important knowledge gaps in the association of SEP with mental health in pre- and early adolescence have emerged that needs to be filled.

First, the focus of most previous studies has been on the association between SEP and a single category of mental health problems, without considering the possibility that SEP may affect different mental health dimensions differently. Two important broad-band domains of maladjustment that cover the large majority of common mental health problems in children and adolescents are externalizing and internalizing problems. The internalizing domain encompasses problems that are linked to internal distress such as anxiety, depression, and (psycho) somatic complaints. The externalizing domain reflects behaviors associated with conflicts with the external environment, such as aggressive and rule breaking behaviors. Differential effects of SEP are likely, because some risk factors have been attributed more frequently to the etiology of externalizing than internalizing problems (Kapi, Veltsista, Kavadias, Lekea, Bakoula, 2007; Loeber, Farrington, Stouthamer-Loeber, Van Kammen, 1998; Mcleod, Shanahan, 1993), or vice versa. For example, influences from deviant peers are known to promote aggressive and delinquent behaviors (Chen, Mathews, Boyce, 2002). On the other hand, the experience of stressful life events and long-term difficulties, especially those characterized by loss, humiliation, and entrapment, is a well-known risk factor for internalizing problems (Brown, Harris, 1989; Kendler, Hettema, Butera, Gardner, Prescott, 2003; Brilman, Ormel, 2001). As the distribution or influence of these risk factors may
vary with SEP, it is possible that different mental health dimensions may have different relationships with SEP. Additionally, internalizing and externalizing problems often co-occur (Angold, Costello, Erkanli, 1999; Lilienfeld, 2003). Past studies have not considered the shared components between mental health dimensions in their associations with SEP. This may lead to misleading findings, because of the afore-mentioned co-occurrence of internalizing and externalizing problems. Thus, research on the differential effects of SEP on different types of mental health problems may shed light on differences in their etiology or course and provide clues for prevention. This topic is addressed in chapter 2.

Second, low SEP has been suggested to promote environments fraught with stressful life events and long-term difficulties (Hatch, Dohrenwend, 2007; Evans 2004). Most previous research on life events and long-term difficulties has focused on individual life events such as parental divorce (Amato, Keith, 1991). Yet, life stressors tend to cluster together. For instance, divorce may be associated with not only separation from a parent but also loss of income, loss of friendships as a result of changing residence, etc. It is imperative to study categories of life stressors instead of individual life events to gain insight into important theoretical questions and hypotheses about the onset and course of various types of psychopathology (Dohrenwend, 2006). Life stressors have commonly been categorized into independent or dependent events (Brown, Harris, 1989; Kendler, Karkowski, Prescott, 1999). Independent life events occur mainly in the environment of children and adolescents, and are unlikely to depend on their behavior or are outside their control, e.g. death of a parent. In contrast, dependent events are largely determined by personal and behavioral characteristics of the child. Different life stressors may uniquely mediate the relation between family SEP and adolescent mental health to varying degrees. Categorization of life stressors may be of theoretical importance, as the source of these stressors may inform interventions targeted either at the environment level (e.g. neighborhood interventions) or the person (e.g. coping strategies). Previous studies have not been conducted to examine the extent to which different categories of life stressors mediate the relation between family SEP and mental health in early adolescents. Chapter 3 deals with this issue.

Third, there has been a paradigm shift from considering only personal or only environmental risk factors of psychopathology to person-environment interactions. Low family SEP is an example of an environmental context that could modify heritable characteristics such as familial loading on psychopathology. Various theoretical approaches have provided conceptual frameworks for person-environment interactions, for example, the “social push” and the “vulnerability” hypotheses. The “social push” hypothesis (Raine, 2002) posits that genetic risks are stronger in contexts with low environmental risks (e.g. high SEP) and weaker in contexts with high environmental risks (e.g. low SEP). The theory underlying this hypothesis is that an adverse environment obscures genetic effects while lack of competing adverse environmental factors enables genetic effects to emerge
more strongly. Thus, low family SEP would reduce the effects of familial psychopathology on adolescent offspring’s mental health while high family SEP would amplify the effects if this hypothesis is true. The vulnerability hypothesis (Shanahan, Hofer. 2005; Plomin, Rutter, 1998; Ormel, Brilman & Oldehinkel. 2001), on the other hand, stipulates that those who are genetically predisposed to psychopathology may be more vulnerable to high risk environments such as low SEP than those without familial vulnerability. Yet, whether environmental contexts such as low family SEP modifies the influence of familial psychopathology on offspring mental health has rarely been studied. Chapter 4 addresses this interaction.

Finally, only a minority of the adolescents with mental health problems seek professional help (Zachrisson, Rodje, Mykletun, 2006), making it vital to study barriers to mental health services. It is estimated that only between 13% and 36% of those with mental health problems in the western world seek help from mental health services (Zachrisson, Rodje, Mykletun, 2006). Family SEP (e.g. education, income, and occupation) is a generic family factor that may be involved in parental recognition and decision to consult a General Practitioner (GP). Coming from a low SEP family could be among the barriers to seeking professional help, especially for children and adolescents who are dependent on their parents to recognize their problems and consult a (GP). Highly educated parents may have superior knowledge about child development, be more aware of mental health problems, appreciate the potential benefits of mental health care more, and have better knowledge of effective treatments than parents with low levels of education.

Previous research linking family SEP and symptoms of offspring mental health problems to mental health service use has been limited in three major ways. First, the use of different definitions and indices of SEP and differences in service organization and health insurance status of the populations studied (Sayal, 2006) yielding conflicting results. Some studies found evidence for a role of family SEP in service use (Zahner et al., 1992; John, Offord, Boyle, Racine, 1995; Pumariega, Glover, Holzer, Nguyen, 1998), whereas others did not (Verhulst, Van der Ende, 1997; Laitinen-Krispijn, van der Ende, Wiersma, Verhulst, 1999). Second, many previous studies were based on secondary analyses of routinely collected health care data, e.g. medical records (Briggs-Gowan et al. 2000; Brugman, et al. 2001; Laitinen-Krispijn, van der Ende, Wiersma, Verhulst, 1999). Persons who are not in medical records are excluded in analyses with routinely collected data, making it impossible to account for the level of psychopathology in the total population. Third, and most importantly, low SEP is negatively associated with severity of mental health problems (Loeber, Farrington, Stouthamer-Loeber, Van Kammen, 1998), and severity of mental health problems, in turn, is positively associated with the use of more mental health services (Zwaanswijk, Verhaak, Bensing, Van der Ende, Verhulst, 2003; Verhulst, Van der Ende, 1997; John, Offord, Boyle, Racine, 1995). Therefore, because of the negative relationship of low SEP with symptoms of mental health problems and the positive association of severity of mental health symptoms with
mental health service use, it is possible that the relation between family SEP and mental health service use may be underestimated without correcting for severity of mental health symptoms. Chapter 5 examines this possibility.

As a result, the objectives of this thesis can be summarized as follows:

1. To investigate whether the associations between family SEP and different mental health problems are domain-specific for internalizing or externalizing problems (chapter 2).
2. To assess the extent to which the relation between low SEP and poor mental health in early adolescents is mediated by specific types of life stressors rated as environment-related or person-related (chapter 3).
3. To assess whether low family SEP provides the environmental contexts that amplify the influence of familial psychopathology on offspring mental health problems (chapter 4).
4. To assess the association between family SEP and specialty mental health service use adjusted for the severity of offspring mental health symptoms (chapter 5).

The outline of the current thesis is diagrammatically represented in figure 1.1 below.
Figure 1.1 Outline of the thesis

Thesis
Examining the link between Socio-economic Position and Mental Health in Early Adolescents

Chapter 1
General introduction

Chapter 2
The Domain-specific link

Chapter 3
The Mediation link

Chapter 4
The Interaction link

Chapter 5
The link with Specialty Mental Health Service Use

Chapter 6
General discussions, conclusions, and summary
The TRAILS study

The studies in this thesis are embedded in the Tracking Adolescents’ Individual Lives Survey (TRAILS) study. TRAILS is a multidisciplinary prospective cohort study of Dutch pre-adolescents (N=2,230) aimed at charting the trajectory of mental health problems from childhood (age 10) to early adulthood (age 24) both at the levels of psychopathology and underlying vulnerabilities and environmental risks. The profile of the TRAILS study is described in details elsewhere (de Winter et al. 2005; Huisman, et al. 2008).

The TRAILS data offers a unique opportunity to study the link between family SEP and psychopathology. First, the study is conducted at a crucial and critical period of life, that is, the period between childhood and adulthood. This period can provide important insights into the pathways to psychopathology. Second, it is reported that a substantial rise in psychopathology occurs during adolescence. For example, the one-year prevalence of psychiatric disorders in the Netherlands increases from 10% at age 10-12 to 25% at age 23-25, and results into significant impairment for nearly half of them (Bijl and Ravelli, 2000). Further, rates of mental health problems in adolescents and early adulthood are projected to rise in the future (Collishaw, Maughan, Goodman, Pickles, 2004). Finally, how the period between childhood and adulthood is navigated has important consequences for adult mental health and future socio-economic achievement (Kessler, Foster, Saunders, Stang, 1995; 1997; 1998).

The TRAILS data employed a robust measure of SEP with five indices (both parent’s education and occupation separately and family income) directly obtained from the parents through an interview. Data on SEP directly obtained from parents are reported to be more reliable than those obtained from their offspring or government records (Wardle, Robb, Johnson, 2002). The SEP index was created by averaging all the five indices after standardization. The index captured 61.2 per cent of the variance in the five indices with an internal consistency of 0.84 in the TRAILS population (Veenstra, Lindenberg, Oldehinkel, De Winter, Verhulst, Ormel, 2005). Missing values (e.g. when there is only one parent in the family) did not affect the associations of the SEP variable with other variables.

Mental health of the TRAILS children was assessed with the parent-rated Child Behavior Checklist (CBCL) (Achenbach, 1991a); the self-rated Youth Self-Report (YSR) (Achenbach, 1991b); and the teacher rated Teacher Checklist of Psychopathology (TCP). The time frame for CBCL and YSR is previous six months and for TCP is the previous 2 months. The TCP consists of descriptions of problem behaviors similar to Achenbach’s Teacher Report Form (TRF) (Achenbach, 1991c). The
CBCL questionnaire and the self-report version YSR are designed to be completed by parents of children aged 4–18 years and by adolescents aged 11–18 years, respectively. Two dimensions of mental health problems were included in the studies in this thesis: internalizing and externalizing problems. Internalizing problems include the syndrome subscales of “Anxious/Depressed”, “Withdrawn/Depressed”, and “Somatic Complaints” while externalizing problems included “Aggressive behavior” and “Rule-breaking behavior”.

In this thesis, a combined estimate of mental health using the scores given by the different informants was computed. Multiple informants are suggested to be the best approach to assess mental health problems (Offord, Boyle, Racine, et al. 1996). For example, it has been demonstrated in previous studies that a combination of parent and teacher information results in an improved power to predict mental health problems (Verhulst, Koot, Van der Ende, 1994). However, using reports from different informants can be challenging. First, agreements between informants tend to be low (Achenbach et al. 1987). The low agreement could be because the informants observe children in different contexts which may influence or even bias their reports. Second, different ways of combining information from different sources can lead to different estimates of mental problems (Youngstrom, Findling, Calabrese, 2003; Kraemer, Measelle, Ablow, Essex, Boyce, Kupfer, 2003; Noordhof, Oldehinkel, Verhulst, Ormel, 2008). On the whole, reports from multiple informants still represent the best approach of estimating mental health problems. As opposed to diagnostic classification systems such as the DSM-IV, the Achenbach scales are empirically-based (i.e., derived from clusters of symptoms found in the datasets rather than experts’ ideas about what should belong together). The syndrome subscales and domains are described in the different studies in this thesis.

In sum, the TRAILS study offers a rich dataset for assessing the link between family SEP and psychopathology in children and early-adolescents.
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