Time Trends in Dutch Children's Mental Health

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TIME TRENDS IN DUTCH CHILDREN'S MENTAL HEALTH

Trends over tijd in de psychische gezondheid van Nederlandse kinderen

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"They always say time changes things, but you actually have to change them yourself"

Andy Warhol

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1 | General Introduction

GENERAL INTRODUCTION

Times are changing and this may well have an effect on the well-being of children and adolescents. It is often suggested, in popular media as well as in scientific literature, that psychosocial problems of children and adolescents have increased over recent decades. However, most studies that indicated such a trend have been hampered by methodological limitations. Methodologically valid studies on this topic are scarce. More objective evidence on changes in children's emotional and behavioral problems is needed to determine whether there is reason to worry about today's youngsters. Information on such changes provides an essential basis for estimating service needs in the population, and, subsequently, for developing an effective health-service policy that provides prevention and intervention strategies that are adjusted to the needs of society's young population. In this study, we investigated secular changes –i.e. changes in population prevalences over time– in emotional and behavioral problems of preschool-age children, school-age children and adolescents over the following time periods respectively: 1989-2003, 1983-2003 and 1993-2003. In this introduction, both the background to which this study has been conducted and the available research on time trends in children's emotional and behavioral problems will be discussed.

Changing times

When describing the context of this study on secular changes, it is important to pay some attention to the changing environment of children and adolescents in the Netherlands. This environment is constantly changing as a result of societal developments, which take place throughout the Western world. Such developments can be separated into those that occur at a global and societal level, the distal changes, and those that occur in the direct environment of the child, the proximal changes.

Distal changes

Several distal changes that have influenced the environment of children and adolescents over recent decades can be identified. Firstly, with regard to economic developments, there has been an overall economic growth in the Netherlands as well as in other Western countries. In the Netherlands, the proportion of people who have a low or minimum income has decreased from 25.6% to 19.9% over the period of 1990-2003 (Vrooman et al., 2005). Economic growth and the decrease of poverty create opportunities for society's youngsters. An increasing amount of money can be spent on education, mental health care, and other important areas in the life of children. These changes can therefore be expected to have a positive effect on children's well-being.

Secondly, several political developments have taken place over recent decades, which have often coincided with political tension. During recent years, the US and Europe have been confronted with serious terrorist attacks, such as

the 9/11 attacks on the World Trade Center in 2001, and the train explosions that took place in Madrid in March 2004. Witnessing terrorism and its consequences, even indirectly through media, can have serious effects on the well-being of children (Silver et al., 2002). Since political tension and terrorism have always been part of society, it is uncertain whether this is a development that has really changed the environment of children. Nevertheless, because of developing media, such as the Internet, children are more directly confronted with information concerning all that is going on in the world, which may induce more anxiety now than in earlier times.

Thirdly, as a result of immigration, the ethnic distributions of several Western societies have changed (Cesari, 2005; Lee and Bean, 2004). According to the Dutch Central Bureau of Statistics, the number of people from a non-Dutch ethnic background living in the Netherlands has increased from 475,873 in 1980 to 1,622,602 in 2003 (CBS, 2007). Effects of these developments on the population's well-being have not directly been investigated, but over recent years the Netherlands has been the stage for interethnic tension (Gijsberts, 2004). Such tension may have its influence on children's functioning.

In addition, the fact that the Dutch society constitutes an increasing number of children from a non-Dutch ethnic background also affects the overall well-being of the young population in a more direct way. Some studies have shown that children from a Turkish or Moroccan background have higher levels of emotional and behavioral problems than Dutch children (Bengi Arslan et al., 1997; Janssen et al., 2004; Stevens et al., 2003). Having an increased proportion of children with higher levels of emotional and behavioral problems living in society thus increases the overall population levels of such problems.

Proximal changes

With regard to changes in the proximal environment of children, several developments can be identified. Firstly, over the last half of the 20th century, the family structures in the Western world have changed. Divorce rates have risen and an increased number of children grow up in single parent families (Hess, 1995). The percentage of divorced couples with children has not increased much in the Netherlands since the 1980s: from 30.2 % in 1980 to 32.2% in 2003 (CBS, 2007). However, the proportion of children living in single-parent families shows an increase from 14,6% in 1995 to 17,6% to 2003 (CBS, 2007). Unfortunately, no such information is available for the years preceding 1995. The increase in the proportion of children living in single parent families may have affected the general well-being of children, since being from a single parent family is associated with a higher risk of developing psychopathology (Garnefski and Diekstra, 1997; O'Connor et al., 2001).

Secondly, mothers in the Netherlands and other Western countries are increasingly participating in the labor force. The number of working couples with a child younger than 5 years old has increased from 127,000 in 1994 to 220,000

in 2002. This specifically concerns families in which the man works at least 35 hours, and the female at least 20 hours. As a consequence of this development, families make increased use of child care services (de Ruijter, 2004). Effects of child care on children's functioning have been subject of debate, since studies have shown mixed findings (Belsky, 2001; Chase-Lansdale et al., 2003; Hill et al., 2005; NICHD, 2003; Zoritch et al., 2006). It appears that the effects of child care on children's functioning are mediated by factors such as the amount of time a child spends in care (NICHD, 2003), the quality of the child care institution (Love et al., 2003) and the child's temperament (Crockenberg, 2003; Watamura et al., 2003).

Thirdly, the education system is constantly changing and developing. School structures are changing and teaching methods are being developed. Although it is sometimes speculated that the pressure on children regarding their scholastic performances has increased, research that has been conducted in the Netherlands showed no changes from 1994 to 1999 with regard to children's well-being, school aversion, and school motivation (Vogels, 2002). Unfortunately, no data are available for the previous or subsequent years.

Fourthly, an important development in the life of children is that new media, such as the Internet, has changed the leisure activities of families and children. The computer has gained a more central role in the household (Hughes Jr and Hans, 2001). In 1990, 40% of the Dutch families owned a personal computer and 24% of the Dutch 12- to 18-year-olds reported weekly computer use, whereas in the year 2000 these percentages were 86% and 67% respectively (Zeijl et al., 2002). Although the easy access to information can be regarded as a positive consequence of the Internet, Internet use also has a downside, given its associated risk of violent or sexual solicitation, which can induce great fear in children (Mitchell et al., 2001). Furthermore, an increasing amount of literature has become available on the danger of addiction to the Internet (Young, 1996) or online gaming (Brian and Wiemer-Hastings, 2005). Moreover, studies have shown violent computer games to be associated with increased aggressive behavior (Uhlmann and Swanson, 2004).

Finally, another important development that may have influenced the well-being of children is that, as more research is being done, the knowledge of children's mental health problems develops, and more becomes known about emotional and behavioral problems and their causes. Not only has the research and knowledge of child and adolescent psychiatric disorders expanded (Costello et al., 2005; Costello et al., 2006b), also more information on psychosocial problems and associated diagnoses has become available and accessible to parents through popular media. Additionally, increased information on adequate parenting has become available, and many interventions are being conducted to inform and support at risk families, a strategy aimed at reducing their children's risk for psychopathology (http://www.nji.nl). Such developments may have positive effects on the parenting styles parents use, and on the way parents deal

with emotional and behavioral problems in their children. Ongoing studies are being conducted to examine the effectiveness of such interventions.

The immediate effects that all proximal and distal changes have on the well-being of today's children and adolescents are very difficult to investigate, since our society is constantly changing and both positive and negative influences take place in a continuous interaction. It is important to first find out whether there is reason to worry about today's children's functioning. If secular changes in children's emotional and behavioral problems are identified, further studies need to take the developments into account that may underlie such changes.

Trends in emotional and behavioral problems

Research investigating time trends has shown evidence that children's mental health problems have increased in recent decades (Fombonne, 1998a; Maughan et al., 2005; Rutter and Smith, 1995). There are several ways to study time trends, or secular changes, in children's mental health. A first method is to study prevalence or incidence rates of psychiatric diagnoses. A second method is to study official statistics on mental-health related outcomes such as crime or suicide rates or treatment data. A third method is to use identical measures of emotional and behavioral problems in population samples from different time periods, assessing problems on a continuous scale.

Trends in psychiatric diagnoses

Several studies have investigated changes in the prevalence or incidence rates of psychiatric diagnoses, and found evidence for increases over recent decades in several psychiatric diagnoses, such as autism, Attention-Deficit/Hyperactivity Disorder (ADHD), and depression (Birmaher et al., 1996; Croen et al., 2002; Fombonne, 1995, 2001; Gurney et al., 2003; Olfson et al., 2003; Robison et al., 2002; Rutter, 2005; Ryan et al., 1992; Toh, 2006; Webb et al., 1997). However, there are several methodological problems with these studies, which have influenced the validity of the results. Results of studies on the psychiatric diagnoses ADHD and autism are influenced by changing diagnostic criteria over time and a better recognition of diagnoses by clinicians, resulting from an increased knowledge of the relevant symptoms (Fombonne, 2001; Maughan et al., 2005). Increases in prevalence rates therefore do not necessarily represent a true increase in the prevalence of these diagnoses in the population. Furthermore, many studies that have suggested an increase in depression have focused on lifetime prevalence rates in different birth cohorts. Since the lifetime prevalence was higher in the younger cohorts, it was suggested that the prevalence of depression has increased over the last half of the 20th century, and that the age of its onset has lowered (Fombonne, 1995). However, these studies focused primarily on adult samples (Maughan et al., 2005), and a recall bias has probably influenced the validity of their findings (Fombonne, 1995; Giuffra and Risch, 1994). A recent meta-analysis, conducted by Costello et al. (2006a) showed no evidence for

an increase in child and adolescent depression over the last 30 years. Hence, methodological problems limit the value of using findings of studies on changing prevalence rates as an indicator of secular changes in children's emotional and behavioral problems.

Statistics and treatment data

Another way to study time trends is to examine official statistics on mental-health related outcomes, e.g. crime statistics, suicide statistics, or mental health treatment data. Smith (1995) described an increase in delinquency in Western countries over the last half of the 20th century. This trend appears to have stabilized during the 1990s (Maughan et al., 2005). Suicide rates have increased during the 20th century, mainly among pubertal males (Diekstra, 1995; Fombonne, 1998b). Research has shown that suicide rates have increased among American youth since 1964, but numbers have dropped during the 1990s (Gould et al., 2003; Judge and Billick, 2004). With regard to treatment data, studies have shown increases from 1995 to 2002 in the number of children visiting outpatient clinics for depression (Ma et al., 2005). Increases have also been found in the number of children hospitalized for mental illness (Kanter and Moran, 2006). Studies have also described an increase in the 1990s in the use of psychotropic medication among school-age children and even among preschoolers (Olfson et al., 2006; Zito et al., 2000; Zito et al., 2002).

However, there are several methodological limitations regarding the use of statistics on crime, suicide or treatment to investigate secular changes in children's mental health. Crime statistics are influenced by changes in people's reporting bias, the chance of being caught, definitions of crime, and registration practices. Suicide statistics are also influenced by changes in registration. Moreover, crime and suicide rates represent only an outcome of serious emotional and behavioral problems, and can therefore only be regarded as an indicator of the prevalence of such problems. A comparable problem appears with regard to studies describing trends in medication use, or in hospitalization and treatment data. Such trends do not necessarily reflect secular changes in psychiatric problems in the population, since they are influenced by recognition of problems, availability of medication, prescription practices, availability of hospital beds, and attitude towards treatment. Hence, the value of official statistics on crime, suicide, or treatment to identify secular changes in the emotional and behavioral problems of children is limited. Since these statistics do not tell the whole story, the trends that appear from these data can only be regarded as an indicator for change in children's functioning.

Studies comparing population samples assessed with identical measures

A more direct way to investigate secular changes in children's emotional and behavioral problem levels is to compare general population samples from different time periods that were assessed using identical measures, assessing

problems on a continuous scale (Maughan et al., 2005). This produces comparable data that are unaffected by methodological variations, changes in registration, differences in criteria, or recall bias. Only few such studies have been conducted. There were no clear changes from 1983 to 1993 in parent and teacher reports of emotional and behavioral problems of Dutch 6- to 16-year old children (Verhulst et al., 1997b). British 15- and 16-year-olds' parent-reported psychosocial problems increased from 1974-1999 (Collishaw et al., 2004). Their conduct problems showed a clear increase over this time period, and their emotional problems showed a small increase. A study among parent and teacher reports on Finnish 8- and 9-year old children found evidence that boys' problems decreased from 1989 to 1999, whereas parent reports of girls' hyperactive problems showed a small increase (Sourander et al., 2004). Self-reports of depressive problems of these Finnish children showed a small increase. American 6- to 16-year-olds' emotional and behavioral problems showed an increase from 1976 to 1989 according to parent and teacher reports, but scores decreased from 1989 to 1999 according to parent, teacher, and self-reports (Achenbach et al., 2002a, 2002b, 2003; Achenbach and Howell, 1993). However, children's problem levels were still higher in 1999 than in 1976 (Achenbach et al., 2003).

Other studies included only self-reports. Fichter et al. (2004) found that from 1980 to 1998, self-reported internalizing problems increased among Greek adolescents in Greece and in Munich. West and Sweeting (2003) found increases in self-reported internalizing problems from 1987 to 1999 among 15-year-old Scottish girls, but not among boys. Wangby et al. (2005) found an increase in self-reported antisocial problems and self-esteem problems from 1970-1996 among Swedish 15-year-old girls.

Hence, different studies from different countries paint a different picture with regard to secular changes. However, most of these studies had limitations, since they investigated only a ten-year time period (Sourander et al., 2004; Verhulst et al., 1997b), investigated only a narrow age range (Collishaw et al., 2004; Sourander et al., 2004; Wangby et al., 2005; West and Sweeting, 2003), focused only on girls (Wangby et al., 2005), obtained data from only one informant (Collishaw et al., 2004; Fichter et al., 2004; Wangby et al., 2005; West and Sweeting, 2003), used only school based samples (Fichter et al., 2004; Wangby et al., 2005), or assessed a limited range of problems (Fichter et al., 2004; West and Sweeting, 2003).

Changing response tendencies

Although comparing population samples is regarded as a valid and adequate method to investigate time trends (Maughan et al., 2005), this method is not without methodological limitations either. Although the use of identical measures for different samples increases the comparability between samples, the way people complete questionnaires, i.e. their response tendencies, could also be subject to change over time. The completion may therefore be different for samples from

different time points. If this is the case, differences in scores may appear that are not due to actual changes in problem levels in society, but due to changes in the way people were biased to answer the questions. This would complicate the validity of the conclusions drawn from the results.

Several developments may influence the comparability of questionnaires completed by samples from different time points. Language that is used in the questionnaire may be more common for samples from certain time periods than others. Also, people from different points in time may differ in their knowledge of the behavior that is questioned. This could be the result of increased attention paid to certain behaviors or symptoms of diagnoses in the media, and might influence the way people perceive specific behaviors, interpret questions, or are susceptible to the language used to describe such behaviors. Such developments can cause differences in the tendency that informants from different time periods have to endorse an item. It is therefore important to investigate whether such response tendencies have changed over time, and have influenced the results of studies comparing data from samples from different time points.

Trends in service use

Since emotional and behavioral problems are associated with a wide range of future adversities, such as future psychiatric problems, increased service use, teen pregnancy, criminality and truncated educational attainment (Fombonne et al., 2001a, 2001b; Hofstra et al., 2002; Kessler et al., 1995, 1997; Knapp et al., 2002; McCrone et al., 2005), it is important to tackle these problems at a young age by providing care to those who need it. The prevalence of children and adolescents' service use may be changing over time, as the result of changes in the prevalence of problems, but also of developments in the care system's intervention and prevention strategies, since these aim at expanding societal and parental knowledge of emotional and behavioral problems in children.

As was described previously, treatment data suggest that children and adolescents are increasingly making use of services for mental health problems. Recent U.S. research has shown increases in the number of children visiting outpatient clinics for depression (Ma et al., 2005), or taking psychotropic drugs (Olfson et al., 2006; Zito et al., 2002). Increases have also been found in the hospitalization of children for mental illness (Kanter and Moran, 2006). Data from a psychiatric case register show that mental health care use has increased in the Netherlands over recent years as well (Sytema et al., 2006). However, the studies described here mainly focused on specific types of care and not on service use for mental health problems in general. Since admission data often originate from specific institutions, such data are not the best indicator of overall service use in the general population. Furthermore, these data do not offer the possibility of taking into account changes in the prevalence of problems. This is important when examining whether the treatment gap, which refers to the difference between the number of children in need and the number of children receiving

care (Kohn et al., 2004), is diminishing. Only few studies compared population samples from different time points to investigate secular trends in general service use for mental health problems, with inconsistent findings. Achenbach et al. (2003) found that the 12-month prevalence of mental health referral among American children and adolescents did not change from 1989 to 1999, while Sourander et al. (2004) found that service use increased among Finnish children from 1989 to 1999. This was the case in the general population, and among children with serious emotional and behavioral problems.

Aims of this study

The study described in this thesis aims to offer insight in the secular changes in emotional and behavioral problems of Dutch children and adolescents that have taken place over recent decades. These changes will be described for children in different age groups, and reports of different informants will be considered. Also, attention will be paid to whether changes in response tendencies have influenced the completion of the instruments. Attention will also be paid to changes in the use of services for mental health problems in the Dutch population. More specifically, the following research questions will be addressed in this thesis:

1. To what extent are there ten-, fourteen-, and twenty-year secular changes in parent-, teacher- and self-reported emotional and behavioral problems of Dutch preschool-age children, school-age children and adolescents?
2. To what extent are reports of emotional and behavioral problems from samples that were assessed at different points in time influenced by changes in people's response tendencies?
3. Did the prevalence of service use for mental health problems change across time in the Dutch general population?

Samples

For this study, data from five population samples are used; two samples consist of preschool-age children and three samples consist of school-age children. One of the preschool samples was assessed in 1989, the other in 2003. Of the three school-age samples, one was assessed in 1983, one in 1993, and one in 2003. The age range differed for the samples under investigation. To enable comparison between the samples, parent reports were used for the 2- and 3-year-olds and for the 6- to 16-year-olds, teacher reports for the 6- to 12-year-olds, and self-reports for the 11- to 18-year-olds.

Preschool-age samples

1989 Sample From the provincial inoculation register of the province of Zuid-Holland, The Netherlands, 400 2- to 3-year-olds were randomly drawn. Because this register did not contain children from the city of Rotterdam, 69 2- to 3-year-olds were randomly drawn from the Rotterdam municipal health service, which

comprised all children living in Rotterdam. Data collection took place between September 1989 and March 1990. Two parents were excluded because they had left the study area and one because of language problems. Of the 466 parents eligible, 421 (90.3%) completed the Child Behavior Checklist for Ages 2-3. Twenty-seven children were excluded because they fell outside the age range, or had missing data on socioeconomic status (SES). Eventually, 394 CBCL/2-3s were selected.

2003 Sample For the 2003 sample, 926 1½- to 5-year-old children were randomly selected from the municipal registers of 35 municipalities in the Dutch province of Zuid-Holland. Parents were sent a letter describing the survey. After a few weeks, parents were contacted by the interviewers and were asked to participate in the study. Data collection took place between December 2003 and April 2005. We excluded 91 children; 76 because their parents did not speak Dutch, 14 because their families left the study area, and one because no eligible person was available to conduct the interview with. Of the 835 eligible respondents, Child Behavior Checklist for Ages 1½-5 were completed for 672 (80.5%) children. To allow for comparison with the 1989 sample, we selected only data on the 279 2- and 3-year-olds, excluding one child due to missing SES data.

School-age samples

1983 Sample For the 1983 sample, 2,600 children were randomly selected from the municipal registers in the province of Zuid-Holland. Two municipalities refused to participate and five parents did not give permission to provide demographic information on their child, leaving 2,517 parents to be contacted. Of the 2,447 4- to 16-year-old children whose parents were reached, 14 children were excluded from participation: the parents of 8 children did not speak Dutch, and for 6 children no eligible parent was available because these children were institutionalized or were living in a foster home. Data collection took place between February 1983 and May 1983. Of the remaining parents eligible, 2,076 (85.3%) completed the Child Behavior Checklist (CBCL). Teacher's Report Forms (TRF) were obtained for 1,067 (83.8%) of the 1,273 4 to 12-year-olds whose parents gave their written permission. The present study included 1,735 6- to 16-year-olds with valid CBCLs and 902 6- to 12-year-olds with valid TRFs.

1993 Sample The 1993 sample originally consisted of 2,917 randomly selected 4- to 18-year-olds living in the Netherlands. Data collection took place between April 1993 and June 1993. Forty-eight children were excluded from the sample; 34 children because their parents did not speak Dutch and 14 children because of physical or intellectual disability. Of the 2,719 parents who could be reached, 2,227 parents completed the CBCL (81.9 %). TRFs were obtained for 1,720 (82.8%) of the 2,078 4- to 18 year-olds whose parents gave their written permission (93.3%). For comparison with the 1983 sample, TRFs of the 897 6- to

12-year-olds were selected for this study. Of the 1,126 11- to 18-year olds whose parents participated, 1,120 (99.5%) completed the Youth Self-Report (YSR) and provided data on police contact, substance abuse and suicidal behavior. Of these, 25 fell out of the age range at the time of measurement.

2003 Sample For the 2003 sample, 2,567 6- to 18-year-olds were randomly selected from municipal registers of 35 municipalities in the Dutch province of Zuid-Holland. Parents were sent letters, describing the survey. After a few weeks, parents were contacted by telephone or at home, and were asked to participate in the study. Data collection took place between December 2003 and April 2005. Of the 2,567 children, we were able to contact the parents of 2,536 children. We excluded 250 children from the sample; 191 whose parents did not speak the Dutch language, 31 who had physical or mental disability, 22 who departed from the study area, and 6 for whom no person could complete the questionnaire because of their living situation. Of the remaining 2,286 eligible respondents, 1,710 (74.8%) parents participated. Subsequently, 1,256 (78.5%) parents of the 1,601 6- to 18-year olds children attending school gave written consent to send the TRF to the child's teacher. Completed TRFs were obtained for 1,151 (91.6%) children. Of the 1,035 11- to 18-year-olds whose parents participated, 860 (83%) provided self-reports. Of these, 50 adolescents fell outside the age range at the time of measurement. The present study included the remaining 810 11- to 18-years old. The present study included 1,417 6- to 16-year-olds with valid CBCLs, and 719 6- to 12-year-olds with valid TRFs.

Structure of this thesis

In Chapter 2 of this thesis, information is provided on secular changes from 1983 to 2003 in Dutch school-age children's emotional and behavioral problems as reported by parents and teachers. In Chapter 3, secular changes from 1989 to 2003 in parent-reported emotional and behavioral problems of 2- and 3-year old children are discussed. In Chapter 4, changes from 1993 to 2003 in the self-reports of emotional and behavioral problems of Dutch adolescents are examined, as well as the differences between trends for different socio-demographic groups. In Chapter 5, information is provided on whether response tendencies have influenced the findings described in Chapter 2, by discussing the results of differential item functioning analyses. Chapter 6 addresses changes in the prevalence of service use for mental health problems in the Dutch population. In this chapter, it is also discussed to what extent these changes can be explained by secular changes in the problem levels of children and by changes in the socio-demographic distribution of society. Chapter 7 provides a general discussion on the conclusions of the study described in this thesis.

2 | Twenty-Year Trends in Emotional and Behavioral Problems of Dutch Children in a Changing Society

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CHAPTER 2: Twenty-Year Trends in Emotional and Behavioral Problems of Dutch Children in a Changing Society

Abstract

Research on changes in the prevalence of children's psychiatric diagnoses has indicated increases over recent decades. However, methodological problems may have influenced results. This study compared children's emotional and behavioral problem levels across three population samples from different time points across twenty years, assessed with identical methodologies. We compared Child Behavior Checklists and Teacher's Report Forms across three population samples of 6- to 16-year-olds, assessed in 1983, 1993 and 2003. We found evidence for small increases in the mean population levels of parent-reported problems, and in the percentages of children with serious problems. These changes regarded mostly internalizing problems. Teacher reports showed less changes. Decreases in scores were found on several areas of competence. Changes were strongest between 1993 and 2003. We found evidence for small increases in Dutch children's problems. Further developments must be monitored, since this trend may continue and have serious societal consequences.

Introduction

In recent years, western societies have experienced several societal changes that may have had their impact on children's well-being. For example, divorce rates have risen, and an increasing proportion of children are living in single parent families (Hess, 1995). Information about secular trends in children's emotional and behavioral problems can inform us if there is empirical ground for concerns about children's well-being. Such information is also of importance for estimating service needs in the population and, subsequently, to develop and effective health service policy.

Time trend research has shown indications that children's mental health problems have increased over recent decades (Fombonne, 1998a; Maughan et al., 2005; Rutter and Smith, 1995). Evidence has been reported for increases in several psychiatric diagnoses. Treatment data and patient records have suggested increases in the number of children diagnosed with ADHD (Olfson et al., 2003; Robison et al., 2002; Toh, 2006). Also, epidemiological studies have suggested an increase in the prevalence of autism (Croen et al., 2002; Fombonne, 2001; Gurney et al., 2003; Webb et al., 1997), and studies on depression have found higher lifetime prevalences in younger birth cohorts, suggesting an earlier age of onset and a secular increase in the prevalence of this disorder (Fombonne, 1994, 1995). Further, increases have been shown in the number of children that were admitted to an outpatient clinic or were hospitalized for a mental illness, and in the use of psychotropic medication among children (Kanter and Moran, 2006;

Ma et al., 2005; Olfson et al., 2006; Zito et al., 2002). Also, crime rates have risen over the last half of the 20th century (Smith, 1995), and suicide rates have increased over recent decades (Rutz and Wasserman, 2004).

Many of these findings, however, are hampered by methodological problems. Results of studies on psychiatric diagnoses are often influenced by changes in diagnostic criteria over time, or a by better recognition of diagnoses by clinicians, resulting from an increased knowledge of the relevant symptoms (Fombonne, 1995, 2001; Maughan et al., 2005). Also, determining the lifetime prevalence of a psychiatric diagnosis can be influenced by memory biases or recall problems (Giuffra and Risch, 1994). Furthermore, trends in medication use or hospitalization and treatment data do not necessarily reflect secular changes in psychiatric problems. These trends are influenced by availability of medication, prescription practices, availability of hospital beds and societal attitudes towards treatment. Moreover, crime and suicide statistics are influenced by registration practices that can be subject to change over time. Also, behavior not leading to a criminal conviction is not registered, which leaves many cases unnoticed.

A more direct way to investigate secular changes in children's emotional and behavioral problems is to compare general population samples from different time periods that were assessed with identical measures, producing comparable data that have not been influenced by variations in method (Maughan et al., 2005). Only few such studies have been conducted, with varying results. No clear changes were seen among Dutch children's emotional and behavioral problems from 1983 to 1993 (Verhulst et al., 1997b). British adolescents' emotional and behavioral problems increased during 1974-1999 (Collishaw et al., 2004). A Finnish study found evidence that boys' problems decreased from 1989 to 1999, whereas girls' problems increased (Sourander et al., 2004). American children's emotional and behavioral problems were shown to have increased from 1976 to 1989, but they decreased from 1989 to 1999 (Achenbach et al., 2003). Most of these studies had some limitations, however, since they investigated only a small ten-year period (Sourander et al., 2004; Verhulst et al., 1997b), had only data on two time points available (Sourander et al., 2004; Verhulst et al., 1997b), focused on a limited age range (Collishaw et al., 2004; Sourander et al., 2004), or obtained data from only one informant (Collishaw et al., 2004).

Aims of the study

Given the sparse number of studies that compared identical assessments from population samples from different time periods, and given the limitations of most of the studies that have been conducted, we investigated the 20-year secular changes from 1983 to 2003 in Dutch children's emotional and behavioral problems and competences in the general population. We compared parent reports and teacher reports on Dutch children's emotional and behavioral problems and competences that were obtained in 1983, 1993 and 2003. We also

investigated whether possible time trends differed for boys and girls or for different age groups.

Method

Participants

For this study, we made use of three population samples; one from 1983, one from 1993, and one from 2003. Written informed consent was obtained for subjects of each sample after complete description of the study to the subjects. Moreover, a Medical Ethics Committee approved all studies. The age range differed for the three samples. To enable comparison between these samples, we used only parent reports for 6- to 16-year-olds and teacher reports for 6- to 12-year-olds.

1983 Sample For the 1983 sample, 2,600 children were randomly selected from municipal registers in the province of Zuid-Holland. Two municipalities refused to participate and 5 parents did not give permission to provide demographic information on their child, leaving 2,517 parents to be contacted. Of the 2,447 4- to 16-year-olds children whose parents were reached, 14 children were excluded from participation; the parents of 8 children did not speak Dutch, and for 6 children no eligible parent was available because these children were institutionalized or were living in a foster home. Data collection took place between February 1983 and May 1983. Of the eligible parents, 2,076 (85.1%) completed the Child Behavior Checklist (CBCL). Teacher's Report Forms (TRFs) were obtained for 1,067 (83.8%) of the 1,273 4- to 12-year-olds whose parents gave their written permission. For an extensive description of the sample and procedure see Verhulst et al. (1985). The present study included 1,735 6- to 16-year-olds with valid CBCLs and 902 6- to 12-year-olds with valid TRFs. In line with Achenbach and Rescorla (2001), a questionnaire was considered valid when no more than 8 items were left unanswered.

1993 Sample The 1993 sample originally consisted of 2,917 randomly selected 4- to 18-year-olds living in the Netherlands. Data collection took place between April 1993 and June 1993. Forty-eight children were excluded from the sample: 34 children because their parents did not speak Dutch and fourteen children because of physical or intellectual disability. Of the 2,719 parents who could be reached, 2,227 parents completed the CBCL (81,9 %). TRFs were obtained for 1,720 (82.8%) of the 2,078 4- to 18 year-olds whose parents gave their written permission (95%). For an extensive description of the sample and procedure see Verhulst et al. (1997a).

Whereas both the 1983 and 2003 samples were drawn from the province of Zuid-Holland, the 1993 sample was a national sample. We therefore performed ANCOVAs, with age, gender, SES and ethnicity as covariates, to examine if there were significant differences in mean scale scores on the CBCL and TRF scales

between children from the 1993 sample living in Zuid-Holland and children from the 1993 sample living elsewhere in the Netherlands. No significant ($p<.05$, two-tailed) differences were found. We therefore decided to use the entire 1993 sample. We included 1,715 6- to 16-year-olds with valid CBCLs and 897 6- to 12-year-olds with valid TRFs.

2003 Sample For the 2003 sample, 2,567 6- to 18-year-olds were randomly selected from municipal registers of 35 municipalities in the Dutch province of Zuid-Holland. Parents were sent letters, describing the survey. Within a couple of weeks, parents were contacted by telephone or at home, and were asked to participate in the study. Data collection took place between December 2003 and April 2005. Of the 2,567 children, we were able to contact parents of 2,536 children. We excluded 250 children from the sample; 191 whose parents did not speak the Dutch language, 31 who had physical or mental disability, 22 who departed from the study area, and 6 for whom no person could complete the questionnaire, because of their living situation. Of the remaining 2,286 eligible respondents, 1,710 (74.8%) parents participated. Children of the responding versus the non-responding parents did not differ with regard to gender ($\chi^2=1.6$, $df=1$, $p>.05$). Subsequently, 786 (87.2%) parents of the 901 6- to 12-year olds children attending school gave written consent to send the TRF to the child's teacher. Completed TRFs were obtained for 719 (91.5%) children. The present study included 1,417 6- to 16-year-olds with valid CBCLs, and 719 6- to 12-year-olds with valid TRFs.

As Table 2.1 indicates, the 2003 sample consisted of fewer children with low socioeconomic status (SES) than the 1983 and the 1993 sample. When comparing the SES distribution of the 2003 sample to the general SES distribution in the province of Zuid Holland in 2003 (CBS, 2007), the low SES group appears to be somewhat underrepresented, probably as a result of exclusion and attrition. In 2003, significantly more people with non-Dutch ethnicity participated than in 1983 or in 1993, which represent a societal development that has taken place over recent decades (CBS, 2007). In 1983, the CBCL was completed by a significantly smaller proportion of mothers than in 1993 or in 2003.

Measures

Emotional and behavioral problems

The CBCL and TRF are instruments of the Achenbach System of Empirically Based Assessment (ASEBA). These interrelated questionnaires have good validity and reliability (Achenbach and Rescorla, 2001b). The CBCL and TRF contain both problem items and competence items. The problem items are scored on a 3-point scale, with responses: 0= not true, 1= somewhat or sometimes true, 2= very true or often true. On the CBCL, parents are asked to rate the child's problems over the preceding 6 months. On the TRF, teachers are asked to rate the child's

Table 2.1: Demographics

Sample	**1983** *(n=1735)*	**1993** *(n=1715)*	**2003** *(n=1417)*
Gender			
Male	49.0%	50.6%	49.8%
Female	51.0%	49.4%	50.2%
Age			
6-11 years	55.8%	56.1%	53.9%
12-16 years	44.2%	43.9%	46.1%
SES*			
Low	33.8%	27.4%	23.7%
Middle	32.3%	38.9%	40.6%
High	33.9%	33.8%	35.7%
Ethnicity**			
Dutch	96.9%	91.2%	78.3%
Non-Dutch	3.1%	8.8%	21.7%
Informant***			
Mother	88.3%	95.5%	94.9%
Other	11.7%	4.5%	5.1%

* Significantly different SES distribution (more low SES participants) in 1983 than in 1993 (χ^2=22.0, df=2, p<.001) or in 2003 (χ^2=42.7, df=2, p<0.001).

** Significantly more non-Dutch participants in 1993 than in 1983 (χ^2=50.0, df=1, p<0.001), and significantly more non-Dutch participants in 2003 than in 1983 (χ^2=265.9, df=1, p<0.001) or in 1993 (χ^2=102.4,df=1,p<.001).

*** Significantly more mothers completed the CBCL in 1993 (χ^2=60.1, df=1, p<0.001) and in 2003 (χ^2=42.9, df=1, p<0.001) than in 1983.

problems over the preceding 2 months. The problem items on these questionnaires are scored on 8 empirically based syndromes that were derived by factor analyses and are similar across the CBCL and TRF: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior and Aggressive Behavior (Achenbach and Rescorla, 2001b). The first three syndromes are also scored on a broadband scale designated as Internalizing, while the last two syndromes are scored on a broadband scale designated as Externalizing. All items can be summed to compute a Total Problems score. The CBCL competence items can be clustered in the following subscales: Activity, Social, School competence, and Total Competence. The TRF competence items can be clustered in an Academic Performance and an Adaptive Functioning scale. Because the ASEBA questionnaires were revised in 2001, we used only the items that were on both pre-2001 and 2001 editions. We therefore excluded 6 CBCL and 3 TRF problem items.

Demographic variables

The total sample was divided into 4 age groups: (1) 6-8 years, (2) 9-11 years (9-12 years for the TRF), (3) 12-14 years, (4) 15-18 years. For the 1983 sample and the 1993 sample, SES was scored according to a 6-step scale of parental occupation (van Westerlaak et al., 1975) and subsequently divided into three SES levels (1 and 2=low SES, 3 and 4=middle SES, 5 and 6=high SES). For the 2003 sample, we used a 5-step Standard Classification of Occupations (CBS, 2001). We made a classification that was comparable to the 1983 and 1993 classification: low SES (unemployed, elementary and lower occupations), middle SES (secondary occupations), and high SES (higher and scientific occupations). Ethnicity was classified as Dutch or non-Dutch. Children with at least one parent born outside of the Netherlands were classified as non-Dutch. For our CBCL analyses, the variable informant was classified as mother or other, including fathers and other informants.

Statistical analyses

For the CBCL, we performed 3 (year) x 2 (gender) x 4 (age group) ANCOVAs on the syndrome scales, the broadband scales, the Total Problems scale, and the competence scales in order to test for differences in the mean scale scores ($p < .05$, two-tailed). To investigate how the population means have changed, regardless of the changes in societal distribution, we used SES, ethnicity and informant as covariates. For the TRF we performed 3 (year) x 2 (gender) x 2 (age group) ANCOVAs on the same scales, with SES and ethnicity as covariates. We report estimated scale means for the three assessment years, which are predicted means that account for differences among the other variables in the specified model. We also report percentages of explained variance that indicate effect sizes for the significant effects of year and interactions of year by age or year by gender. An effect size of 1 to 5.9% is small, an effect size of 6 to 13.8% is medium, and an effect size exceeding 13.8% is large (Cohen, 1988). To investigate whether the percentage of children scoring in the deviant range of the scales differed between 1983, 1993 and 2003, we first calculated cut-off scores on the CBCL and TRF problem scales for gender and age (6-11 and 12-18 for the CBCL; 6-12 for the TRF) separately, thereby creating 4 different CBCL norm groups and 2 TRF norm groups. In line with Achenbach and Rescorla (2001b), children having a Total Problems, Internalizing or Externalizing score in the 84th percentile of the norm group or higher were classified as having deviant problems. With regard to the syndrome scales, children scoring in the 93rd percentile or higher were classified as having deviant problems. We performed logistic regressions to calculate percentages that were adjusted for the effects of SES and ethnicity. To judge the magnitude of the effects of the differences, we used the effect size h, as proposed by Cohen (1988) to judge differences between proportions.

To investigate whether the comorbidity distribution differed for the three samples, and to combine data from the two informants, we computed a variable

that indicated whether the child scored deviant on either the internalizing scale, the externalizing scale or on both. Children were classified as scoring deviant when at least one of the two informants scored him or her as deviant. We performed χ^2-analyses to examine whether this distribution differed for the three samples. Since we used both teacher reports and parent reports, this analysis could only be performed on the 6- to 12-year-olds.

Results

Time trends in parent reports

Scores on 10 out of 11 scales showed significant effects of year, indicating that there were significant differences between means in 1983, 1993, and 2003 (Table 2.2). Five scales showed a consistent increase from 1983 to 2003. Three scales increased only significantly between 1993 and 2003, whereas one scale, Withdrawn/Depressed, decreased between 1983 and 1993, and increased between 1993 and 2003. However, changes on only three of the scales had at least a small effect size (Cohen, 1988). These were: Anxious/Depressed, Somatic Problems, and Internalizing.

Significant interaction effects of year by age group were found for five scales (data not shown in table): Withdrawn/Depressed, Rule Breaking Behavior, Aggressive Behavior, Externalizing, and Total Problems. These interactions indicated that between 1983 and 1993, scores increased for the 12- to 16-year-olds, whereas scores decreased for the 6- to 11-year-olds. Between 1993 and 2003, scores increased for all age groups. However, none of these interaction effects reached the size of a small effect (Cohen, 1988). There were no significant interaction effects of year by gender.

Significant effects of SES for all scales indicated higher problem scores in low SES children. However, on only three scales these effects reached the size of a small effect: Rule-Breaking Behavior, Externalizing and Total Problems. Five scales showed significant effects of ethnicity, indicating higher problem scores for non-Dutch children. However, none of these reached the size of a small effect.

Time trends in teacher reports

A significant effect of year was found for only one TRF scale, indicating that Attention Problems scores were significantly higher in 2003 than in 1983 and 1993 (Table 2.2). However, this change did not reach the size of a small effect according to Cohen (1988). Results showed no significant interaction effects of year by age group or year by gender in the TRF reports (data not shown in table).

Significant effects of SES for 10 of the 11 scales indicated higher problem scores in low-SES children. For only three scales (Total Problems, Social Problems and Attention Problems) these effects reached the size of a small effect. Effects of ethnicity were significant for 8 scales and indicated higher problem scores for non-Dutch children. However, only the effect of ethnicity on the Rule-Breaking Behavior scale reached the size of a small effect.

Table 2.2: CBCL and TRF estimated means and percentages of explained variance for significant effects of year resulting from ANCOVAs (p<.05, two-tailed), adjusted for SES, Ethnicity and Informant

	CBCL			Year	TRF			Year
	1983	1993	2003	%	1983	1993	2003	%
Syndrome Scales								
Anxious/Depressed	2.3	2.6	3.2	1.3 $^{3>2>1}$	2.9	3.1	3.0	-
Withdrawn/Depressed	1.7	1.5	1.8	0.4 $^{3>2;3>1;1>2}$	1.8	1.7	1.6	-
Somatic Complaints	1.0	1.2	1.5	1.2 $^{3>2>1}$	0.4	0.4	0.5	-
Social Problems	2.1	2.0	2.3	0.2 $^{3>2;3>1}$	1.8	1.9	1.8	-
Thought Problems	1.5	1.8	2.0	0.9 $^{3>2>1}$	0.5	0.6	0.6	-
Attention Problems	2.6	2.5	2.8	0.2 $^{3>1;3>2}$	7.2	7.6	8.6	0.5 $^{3>1;3>2}$
Rule-Breaking Behavior	1.2	1.3	1.5	0.5 $^{3>2>1}$	0.8	0.8	0.9	-
Aggressive Behavior	4.7	4.4	4.7	-	3.2	2.9	3.3	-
Broadband Scales								
Internalizing	5.0	5.4	6.5	1.3 $^{3>2>1}$	5.1	5.3	5.1	-
Externalizing	5.8	5.7	6.2	0.1 $^{3>2}$	3.9	3.7	4.1	-
Total Problems	19.9	20.2	23.5	0.9 $^{3>1;3>2}$	19.2	19.6	20.9	-

Note: 3>1 indicates mean score in 2003 significantly higher than mean score in 1983; 3>2 indicates mean score in 2003 significantly higher than mean score in 1993; 2>1 indicates mean score in 1993 higher than mean score in 1983.

Children scoring in the deviant range

Logistic regressions that were used to calculate percentages of deviant scoring children showed a significant effect of year for 10 out of 11 CBCL scales, indicating that there were significant differences between the proportions of deviant-scoring children in 1983, 1993 and 2003 (Table 2.3). The percentage of deviant scorers increased continuously from 1983 to 2003 for the Anxious/Depressed scale. For most scales, logistic regression results indicated that the percentages increased significantly between 1993 and 2003, and not between 1983 and 1993. For the Thought Problems scale, however, the increase took place between 1983 and 1993. Decreases from 1983 to 1993 were seen for the Attention problems scale and the Aggressive Behavior scale. However, only three of the changes reached the size of a small effect (Cohen, 1988). These were the changes between 1983 and 2003 in the proportions of deviant-scoring children on the Anxious/Depressed, the Somatic Complaints, and the Internalizing scale.

For the TRF, significant increases between 1993 and 2003 were seen in proportions of deviant scorers on the Attention Problems scale and the Externalizing scale (Table 2.3). For the Rule-Breaking Behavior scale, percentages increased between 1983 and 2003. However, none of these changes reached the size of a small effect (Cohen, 1988).

Table 2.3: Estimated percentages of children scoring in the deviant range

	CBCL*			TRF*		
	1983	1993	2003	1983	1993	2003
Syndrome Scales						
Anxious/Depressed	7.1[a b]	9.3[b c]	14.4[a c]	8.0	8.5	8.3
Withdrawn/Depressed	11.1	10.9	12.8	12.3	12.0	10.8
Somatic Complaints	9.0[a]	10.8[c]	16.6[a c]	9.8	11.0	12.4
Social Problems	9.8[a]	9.5[c]	12.3[a c]	8.8	10.2	9.6
Thought Problems	8.0[a b]	11.2[b]	12.2[a]	12.8	13.5	13.7
Attention Problems	10.9[b]	8.8[b]	10.9	6.9[a]	6.5[c]	10.1[a c]
Rule-Breaking Behavior	10.9[a]	9.8[c]	14.1[a c]	12.3[a]	13.3	15.9[a]
Aggressive Behavior	10.1[a]	7.2[a]	9.2	8.4	7.0	8.5
Broadband scales						
Externalizing	18.4	17.7[c]	20.9[c]	20.4	18.6[c]	23.2[c]
Internalizing	16.5[a]	18.0[c]	26.8[a c]	16.3	18.1	17.6
Total Problems	16.3[a]	14.3[c]	22.0[a c]	15.4	17.0	19.0

* Identical superscripts indicate that logistic regressions have shown significant differences between these percentages in different years ($p<.05$).

Competence scores

As Table 2.4 indicates, we found several significant changes for the competence scales. Scores on the CBCL Activity and Total Competence scale showed an overall increase from 1983 to 2003. They increased from 1983 to 1993, and decreased again from 1993 to 2003, as did the TRF Adaptive Functioning scale score. The CBCL Social score increased between 1993 and 2003, whereas the CBCL School Competence score decreased between 1993 and 2003. The score on the TRF Academic Performance scale increased significantly between 1983 and 1993, but did not change between 1993 and 2003.

Table 2.4: Estimated means and percentages of explained variance for significant effects of year on competence scales of the CBCL and TRF

	Means[1]			Year
	1983	1993	2003	%
Competence scores CBCL				
Activity	6.9[a]	8.2[a]	7.5[a]	4.6
Social	7.7[a]	7.8[b]	8.3[a b]	1.1
School Competence	4.9[a]	4.9[b]	4.6[a b]	2.0
Total Competence	19.5[a]	21.0[a]	20.4[a]	2.3
Competence scores TRF				
Academic Performance	3.4[a b]	3.7[b]	3.6[a]	2.8
Adaptive Functioning	17.6[a]	18.6[a b]	17.7[b]	1.0

[1] Identical superscripts indicate significant differences between these means ($p<.05$).

Comorbidity

Results indicated that when both teacher and parent reports were considered, there were changes in the distribution of the children who had either no deviant score, only a deviant internalizing score, only a deviant externalizing score, or had both internalizing and externalizing deviant scores (Table 2.5). In 2003 there were more children with internalizing problems or with both internalizing and internalizing problems than in 1993 or 1983. When only the children with deviant scores were included in the analyses, the 2003 distribution differed significantly from the 1993 distribution (χ^2=9.2, df=2, p=.01), with more children with internalizing problems or with a combination of problems.

Table 2.5: Percentages of children scoring deviant according to parents or teachers

	% **deviant-scoring children**		
	1983[a]	**1993**[b]	**2003**[a b]
None	54.2	55.2	47.5
Deviant internalizing only	14.0	15.8	19.2
Deviant externalizing only	16.0	16.9	15.0
Deviant internalizing and externalizing	15.8	12.1	18.3

[a] The 1983 distribution differs significantly from the 2003 distribution (χ^2=11.8, df=3, p<.01).

[b] The 1993 distribution differs significantly from the 2003 distribution (χ^2=18.6, df=3, p<.001).

Discussion

We investigated 20-year time trends in parent- and teacher-reported emotional and behavioral problems among Dutch children. We found several small increases from 1983 to 2003, mainly regarding parent-reported internalizing problem scores and in the proportion of children scoring in the deviant range of several problem scales. For several competencies, mean scale scores decreased, mostly between 1993 and 2003. We found no clear evidence for gender- or age-specific trends.

We found an increase in several parent-reported internalizing problems, mostly anxious/depressed and somatic problems, over the 20-year period of investigation. Scores significantly increased between 1993 and 2003. The percentages of deviant scoring children also increased significantly for these scales. No such developments were seen on the teacher reports.

These findings are partially in line with the findings of Collishaw et al. (2004), who found that parent-reported emotional problems increased among British adolescents, and with findings of Santalahti et al. (2005), who found that parent-reported somatic problems increased among Finnish children. However, teacher- and parent-reported emotional problems of these Finnish children did not increase. Although Achenbach et al. (2003) found an increase in parent-reported internalizing problems of American children from 1976 to 1989, this

increase was followed by a decrease from 1989 to 1999, which contradicts our findings. In a recent meta-analysis, Costello et al. (2006b) found no evidence for an increase in child and adolescent depression since the 1970s. Hence, findings from different population studies on secular increases in internalizing problems vary.

With regard to externalizing problems, no increases in the parent and teacher reports reached the size of a small effect. However, the percentages of children scoring deviant on the Rule-Breaking Behavior scale increased significantly for both parents and teachers. Teacher reports also showed an increase between 1983 and 2003 in the proportion of children with deviant externalizing scores. Our findings are less strong than the clear increase in parent-reported conduct problems in British 15- and 16-year-olds' conduct problems from 1974 to 1999, which was found by Collishaw et al. (2004). However, Sourander et al. (2004) found no increases in such problems among Finnish children. Achenbach et al. (2003) found an increase in American children's externalizing problems from 1976 to 1989, but this was followed by a decrease from 1989 to 1999, which is not in line with our findings.

Teacher reports indicated a small increase in Attention Problems and an increase in deviant scoring children on this scale. No clear changes in hyperactive problems were found among British adolescents (Collishaw et al., 2004). Sourander et al. (2004) found a small decrease in teacher-reported hyperactive problems of Finnish boys, while girls' problems increased. Achenbach found a decrease during the 90s among American children according to their parents and teachers. Our findings also indicate a small increase in parent-reported Thought Problems from 1983 to 1993. No such a development was seen among American children (Achenbach et al., 2002b; Achenbach et al., 2003).

Children with both serious internalizing and externalizing problems, according to either parents or teachers, were more prevalent among the children with problems in 2003 than in 1993 or 1983. This indicates that not only the number of children with serious internalizing problems increased, but also the number of children that are having serious problems on both the emotional and behavioral area, which is a worrisome development.

Most competencies increased between 1983 and 1993, but decreased again between 1993 and 2003. The increase in Dutch children's problems, which mostly took place between 1993 and 2003, seems to be accompanied by a decrease in several competencies. Achenbach et al. (2002b) also investigated secular changes in competencies, but their results indicated a decrease from 1976 to 1989, and an increase from 1989 to 1999 in American children's competencies.

The comparison with findings from population studies that were conducted in other countries highlight intercultural and inter-informant differences. A cross-cultural comparison reveals a complex picture. Although earlier studies have described increases in the prevalence and treatment of

psychiatric diagnoses (Croen et al., 2002; Fombonne, 2001; Gurney et al., 2003; Olfson et al., 2003; Robison et al., 2002; Toh, 2006; Webb et al., 1997), the studies comparing population samples, using a more direct methodology, could not confirm such clear changes. Given the variety of results, one may wonder whether such secular changes can be compared cross-culturally. However, many developments that change the environment of children, and that therefore are thought to affect such secular changes, are taking place throughout the Western world (e.g. changing societal distribution, economic growth, changing family structures, increased mothers employment, changing leisure activities). The fact that the different population studies cannot be compared exactly given the use of different instruments, different informants, different age ranges, and different time periods, may have affected the differences between the results to some extent.

Differences in results appear also between informants. Our results have shown the strongest changes in the parent reports and weaker changes in teacher reports. Differences between informants are seen in other time trends studies as well (Achenbach et al., 2002a, 2002b, 2003; Sourander et al., 2004). It is widely acknowledged that multiple informants are needed to obtain a comprehensive view on children's behavior (Ferdinand et al., 2004), because discrepancies are often found among informants (De Los Reyes and Kazdin, 2005; van der Ende, 1999). These discrepancies present interpretive challenges, considering that no informant qualifies as the 'gold standard'. Children's problems at school may show different trends than at home. Informants' frames of reference may change over time as well, which could contribute to differences in time trends across different informants. Given these complexities, it is important to look at the overall picture. Hence, although parent reports showed clearer changes than teacher reports, we found evidence that children's emotional and behavioral problems increased over the period 1983-2003.

Our study enabled us to investigate the presence of time trends, but it did not enable us to explain such secular changes. Explaining time trends is difficult, considering that as time passes, many developments are taking place on a more proximal and a more distal level. Moreover, as some societal developments are often thought to have a negative effect on children's well-being (rising divorce rates and changing family structures, changing leisure activities of families, political tension), other developments may have positive effects on children's well-being (economical growth has created opportunities for children; prevention and intervention projects focus at children with problems). A first step towards understanding effects of such developments is to investigate the presence of secular changes, by conducting methodologically adequate studies.

Although we have tried to determine the importance of the effects by commenting on the effect sizes, it can be argued that the change itself is more important than the effect size, considering its possible public health implications. On one hand, all effects of the increases we found were very small, so it is difficult

to consider our data firm evidence that children are doing worse. On the other hand, considering the subject under investigation, the small increases we found may have worrisome consequences. Small increases may lead to a marked increase in individuals with problem scores at the high end of the distribution and who may be in need of mental health care. We indeed found a small, but significant increase in the proportion of children scoring in the deviant range of the scales. Since these children will marry and bear their own children, who are at higher risk for problems given their parental psychopathology, effects of small changes may compound to have serious consequences at a societal level. It is also important to bear in mind that our findings span a relatively brief time interval. Our study showed that over a 20-year period more changes could be identified than over a 10-year period. Further studies are needed to monitor further developments, cross-cultural differences and explanatory mechanisms. These studies need to focus on changes in service use as well. If data on secular changes in problems are combined with data on changes service use, this elucidates how the number of children that experience an unmet need develops over time, which is sufficient information for developing an effective health service policy.

This study has some limitations. The most important limitation was that the 2003 sample differed from the 1983 and the 1993 sample in several ways. First, the response rate of the 2003 sample was lower than that of the 1983 and 1993 sample, which could have affected the results. When comparing the 2003 low SES distribution to the general SES distribution in Zuid-Holland (CBS, 2007), the low SES group appears to be underrepresented. This probably has influenced the difference in SES distribution between the two samples, and contradicts the appeared effect that in 2003 there were less 'poor' children living in the province of Zuid-Holland. The fact that different classification systems were used to determine SES in the two samples may also have contributed to the differences in SES distribution. If there would have been less attrition and exclusion in the low-SES group, we suspect that trends would have been somewhat stronger, since probably the low-SES children with most problems did not participate.

Another limitation of our study was that 7.2% of the children selected for the 2003 sample were not assessed, because their parents could not speak Dutch. Most were low SES Turkish and Moroccan immigrants. A consequence of excluding a substantial proportion of children, because their parents did not speak Dutch is that our findings can only be generalized to the Dutch speaking part of the population. Since studies in the Netherlands have shown some evidence that these children have higher problems than Dutch children, although evidence is somewhat mixed (Bengi Arslan et al., 1997; Janssen et al., 2004; Stevens et al., 2003), and since we have found some significant effects of ethnicity in this study, we might have excluded a specific, more problematic group. Including ethnicity as a covariate may not be sufficient to control for the effects of

the increase in non-Dutch children. We therefore rerun our analyses on the Dutch children only. These analyses revealed similar results.

The development that society is becoming increasingly multicultural may have an effect on the mean population problem levels of children, especially since effects of ethnicity indicated non-Dutch children to have higher problem levels. It can be argued that we were not able to gain insight in such effects, since we controlled for ethnicity. We therefore repeated our analyses without including ethnicity as a covariate. However, these analyses revealed similar results.

Another limitation is that we have conducted tests for many outcomes, which increases the odds to find significant results. To evaluate the importance of the significant effects, we have taken into account effect size as well. Also, we only used data on teachers and parents, and not self-reports, which may especially be important with regard to internalizing problems in adolescence.

In conclusion, although problem levels in society showed only small increases, we found evidence that the proportion of children in need for problems, especially internalizing problems, have increased from 1983 to 2003. Furthermore, according to teacher reports, attention problems among children are increasing, which may have consequences for children's performance at school. Since the small effects we found may have larger societal consequences, mental health services, as well as the school system, should be prepared and equipped to experience a possible rise in children and adolescents with problems, and there is a need for adequate programs on prevention and intervention.

3 | Fourteen-Year Changes in Emotional and Behavioral Problems of Dutch Very Young Children

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CHAPTER 3: Fourteen-Year Trends in Emotional and Behavioral Problems of Dutch Very Young Children

Abstract

The societal changes experienced by Western societies over recent decades have raised concerns about increases in the level of children's mental health problems. Although studies on secular changes in the prevalence of psychiatric diagnoses have indeed shown increases, their results may have been influenced by methodological problems, such as changing diagnostic criteria. Although repeated population studies using identical measures have not indicated such a clear rise in mental health problems, these studies have been limited to school-aged children. We therefore investigated changes in Dutch parents' reports of very young children's emotional and behavioral problems over a fourteen-year period. We compared Child Behavior Checklist scores across two Dutch general population samples of 2- and 3-year-olds, one assessed in 1989 and one in 2003. Results revealed only a few changes over time, indicating small decreases in parent-reported problems. Between 1989 and 2003, there were falls in the mean scores and in the proportions of children with deviant scores on the Anxious/Depressed, Total Problems, Internalizing, and DSM-oriented Attention Deficit/Hyperactivity Problems scales. It thus appears that despite indications of increasing problems among school-age children and adolescents, parent-reported problem levels of very young Dutch children have not increased. Our findings even showed some small improvements in parents' reports of very young children's functioning between 1989 and 2003.

Introduction

In recent years, Western societies have undergone several changes that may have affected children's well-being. These changes include a higher proportion of children living in single-parent families (Hess, 1995), greater day-care use brought about by the fact that more mothers work outside the home (de Ruijter, 2004), and the more multicultural nature of society (Lee and Bean, 2004). To establish whether there are empirical grounds for such concerns about children's well-being and to estimate service needs in the population, information is needed on secular changes –i.e. changes in population prevalences over time– in children's emotional and behavioral problems. To date, secular-trend studies on emotional and behavioral problems in children have focused exclusively on school-age children (Maughan et al., 2005). This study is the first to investigate changes with regard to behavioral and emotional problems in very young children.

Although research on time trends has reported increases in children's mental health problems over recent decades, the findings vary according to the type of problems (Fombonne, 1998; Maughan et al., 2005; Rutter and Smith,

1995). However, results of many studies are hampered by a number of methodological problems, such as changes in diagnostic criteria over time or registration biases (Maughan et al., 2005). A direct way to investigate secular changes in children's emotional and behavioral problems is to compare general population samples from different time periods that were assessed using identical measures. This will produce comparable data that are unaffected by methodological variations (Achenbach et al., 2003; Maughan et al., 2005). Until now, such studies have been conducted only among school-age children and adolescents.

Little information is currently available on psychiatric problems in very young children, as the psychiatric nosology and epidemiology among this age group are still in their early days (Egger and Angold, 2006). But thanks to the development and refinement of reliable measures for assessing psychopathology among preschoolers (Carter et al., 2004), it has nonetheless become very clear that mental health problems are already present in such young children. As preschool problems persist into later ages and predict later problems (Keenan et al., 1998; Lavigne et al., 1998; Mathiesen and Sanson, 2000; Mesman and Koot, 2001), it is important to focus on such problems at an early age. If secular increases can already be seen among very young children, then causative explanations for them can be sought in factors that play a role in such young children's environment.

Because little information is available on time trends in emotional and behavioral problems among very young children, we sought insight into possible changes in parent reports of such problems by comparing two population samples of very young Dutch children. The first of these samples had been assessed in 1989 and the second in 2003. We also examined whether there were gender differences in secular changes.

Method

Sample description

1989 Sample For the 1989 sample, 400 2- to 3-year-olds were randomly drawn from the provincial inoculation register of the province of Zuid-Holland, the Netherlands. Because this register did not contain children from the city of Rotterdam, 69 2- to 3-year-olds were also randomly drawn from the register of the Rotterdam municipal health service, which contains data on all children living in Rotterdam. Data collection took place between September 1989 and March 1990. Two children were excluded because their families had left the study area, and one child because of language problems of its parents. Of the 466 parents eligible, 421 (90.3%) completed the Child Behavior Checklist for Ages 2-3 (CBCL/2-3). Twenty-eight children were excluded because they were either 1 or 4 years old, or because data on socioeconomic status (SES) was missing. Eventually, 394 CBCL/2-3s were selected. For more information, see Koot and Verhulst (1991).

2003 Sample For the 2003 sample, 926 1½- to 5-year-old children were randomly selected from the municipal registers of 35 municipalities in the Dutch province of Zuid-Holland. Parents were sent a letter describing the survey. Within a few weeks, parents were contacted by the interviewers and were asked to participate in the study. Data collection took place between December 2003 and April 2005. The following 91 children were excluded from the sample: children with intellectual disabilities, those with major physical disabilities, those whose parents did not speak Dutch, and those in families who had left the study area. Of the 835 eligible respondents, CBCLs were completed for 672 (80.5%) children. The response rate for the 2- to 3-year olds was 79.6%; for the 4- and 5-year-olds it was 81.0%. Significantly more parents of boys than girls participated (χ^2=5.13, df=1, p<.05). To allow for comparison with the 1989 sample, we selected only data on the 2- and 3-year-olds (n=279), excluding one child due to missing SES data.

Table 3.1: Demographics

Sample	**1989** *(n=394)*	**2003** *(n=279)*
Gender		
Male	51.5 %	50.9 %
Female	48.5 %	49.1 %
Age		
2 years	51.0 %	48.0 %
3 years	49.0 %	52.0 %
SES*		
Low SES	28.3 %	15.5 %
Middle SES	38.3 %	40.6 %
High SES	33.4 %	43.9 %
Ethnicity**		
Dutch	95.2 %	75.3 %
Non-Dutch	4.8 %	24.7 %
Informant		
Mother	98.2%	96.8%
Other	1.8%	3.2%

* Significant difference between the SES distribution of 1989 and that of 2003 (χ=16.64, df=2, p<0.001).

** Significantly more non-Dutch respondents in 2003 than in 1989 (χ =57.0, df=1, p<0.001).

Compared to the 1989 sample, the 2003 sample included fewer children with a low SES and more from a non-Dutch ethnic background (Table 3.1). After parents had been given a complete description of the study, written informed consent was obtained for the subjects of each sample. Each study was approved by the Medical Ethics Committee of the Erasmus University Medical Center.

Measures

Emotional and behavioral problems

To assess emotional and behavioral problems in 1989, we used the Child Behavior Checklist/2-3, whereas in 2003 we used the Child Behavior Checklist/1½-5. When the CBCL/2-3 was revised in to the CBCL/1½-5, two items were replaced. Item 51: 'overweight' was replaced with 'shows panic for no reason', and item 79 'stores up many think that he/she does not need' was replaced with 'rapid shifts between panic and excitement'. We used only the items that were similar on the CBCL/2-3 and the CBCL/1½ -5, thereby excluding item 51 and item 79.

The CBCL has good reliability and validity (Achenbach and Rescorla, 2001a). Parents rate the child's emotional and behavioral problems over the preceding two months, items being scored on a three-point scale, with responses: 0=not true, 1=somewhat or sometimes true, and 2=often true or very true.

The 100 problem items on the CBCL are scored on seven empirically based syndromes that were derived by factor analyses: Emotionally Reactive, Anxious/Depressed, Somatic Complaints, Withdrawn, Sleep Problems, Attention Problems, and Aggressive Behavior. The first four syndromes are also scored on a broadband scale designated as Internalizing, while the last two syndromes are scored on a broadband scale designated as Externalizing.

To facilitate comparison of the ASEBA scores with DSM-IV categories, Achenbach and Rescorla (2001a) developed DSM-oriented scales for the ASEBA questionnaires by having psychologists and psychiatrists from 16 different cultures identify items that are very consistent with DSM-IV categories. This resulted in the following DSM-oriented scales: Affective Problems, Anxiety Problems, Pervasive Developmental Problems, Attention Deficit/Hyperactivity Problems, and Oppositional Defiant Problems.

Demographic variables

For the 1989 sample, SES was scored according to a six-step scale regarding parental occupation (Van Westerlaak et al., 1975), and subsequently divided into three SES levels (1 and 2=low SES, 3 and 4=middle SES, and 5 and 6=high SES). For the 2003 sample, we used the five-step Standard Classification of Occupations (CBS, 2001), which we divided into low SES (unemployed, elementary, and lower occupations); middle SES (secondary occupations); and high SES (higher and scientific occupations). Ethnicity was classified as Dutch or non-Dutch. Children who were born outside the Netherlands or had at least one parent born outside of the Netherlands were classified as non-Dutch. Informant was classified as mother or other, the latter including father or other informants.

Statistical methods

Chi-square tests were conducted to analyze socio-demographic differences between the two samples (Table 3.1). To test for differences in the mean item and

scale scores, we performed 2 (year) x 2 (gender) x 2 (age in years) ANCOVAs in which SES, ethnicity and informant were covariates on the raw scores on the 98 problem items (p<. 05, two-tailed). We also performed 2 x 2 x 2 ANCOVAs adjusted for SES, ethnicity and informant on the seven syndrome scales, the five DSM-oriented scales, the two broadband scales and the Total Problems scale (p<. 05, two-tailed). Similarly, we examined the interaction effects of year by gender and year by age.

We report estimated means for the two assessment years. Estimated means are means that are adjusted for the effects of the other covariates in the analyses and are estimates of the means that would have been calculated if the different categories of the covariates SES, ethnicity, and informant had been distributed equally across the two samples.

Cohen (1988) describes several interrelated effect size measures pertaining to analyses of variance. As he showed, all measures can be readily interpreted in terms of percentages of explained variance (Cohen, 1988). We therefore reported percentages of explained variance as measures of effect size for the significant effects of year and significant interaction effects of year by age, or year by gender.

To be able to detect a small effect, we performed a power analysis to examine whether we had enough children in our sample. To find a significant effect of year with alpha set at .05, with a small effect size of 1%, a sample of 393 children is needed for a power of .80 and of 526 children for a power of .90 (Cohen, 1988). Since our sample contained 669 children, we were ensured of having sufficient power to detect even small effects.

To investigate whether the percentages of children scoring in the deviant range of the scales changed significantly between 1989 and 2003, we calculated cut-off scores on the CBCL for both genders separately, thereby creating two different norm groups. In line with Achenbach and Rescorla (2001a), children having a Total Problems, Internalizing, or Externalizing score in the eighty-third percentile of the norm group or higher were classified as having deviant problems. Children scoring in or above the 93rd percentile of the syndrome and DSM-oriented scales were classified as having a deviant score. For each year, we calculated percentages of deviant scorers for all scales.

We performed logistic regressions to obtain percentages that were adjusted for SES and ethnicity. To test the stability of item rankings, we first computed item means for all problem items for each year separately. In this way, we obtained two lists of 98 item means. Next, we computed a correlation between the item rankings of these two lists.

Results

Changes on item scores

Whereas 9 item scores increased from 1989 to 2003, 21 decreased (Table 3.2). All effect sizes were small (<1-5%), with the exception of one medium effect size (7%) indicating a decrease for the item 'sulks a lot'.

Our results identified 7 small (<1%-1%) interaction effects. Although two effects ('Disobedient' and 'Smears bowel movement') indicated a decrease among boys and an increase among girls, one effect ('Sleeps little') indicated a decrease among girls and an increase among boys. On one item ('Resists bed') boys' scores increased more strongly than girls' scores did. Two interaction effects ('No fun' and 'Resists toilet' items 26 and 65) indicated lower scores for 2-year-olds in 2003 and higher scores for 3-year-olds, whereas one item ('Fears') revealed the opposite effect.

Changes on scale scores

Our results identified four small significant effects of year (Table 3.3). Compared to those for the 1989 sample, four mean scale scores were lower for the 2003 sample: Anxious/Depressed, Internalizing, DSM-oriented Attention-Deficit/Hyperactivity Problems, and Total Problems. The results revealed no interaction effects of year by age and year by gender. There were significant overall effects of SES for 13 of 15 scales, all indicating the highest problem scores in lower SES children and the lowest in higher SES children. Significant overall effects of ethnicity were found for 10 of 15 scales (not shown in table), all indicating highest problem scores in non-Dutch children.

Categorical analyses

The percentages of children scoring in the deviant range are displayed in Table 3.4. The logistic regressions that were used to calculate percentages of deviant scoring children indicated significant effects of years, indicating lower odds of having a deviant score in 2003, for the following four scales: Anxious/Depressed (Odds Ratio: 0.51, CI: 0.31-0.84), Internalizing (OR: 0.63, CI: 0.40-0.98), Total Problems (OR: 0.60, CI: 0.38-0.95), and the DSM-oriented Attention-Deficit/Hyperactivity Problems (OR: 0.38, CI: 0.21-0.70).

Item ranks

The two sets of mean item scores (1989 and 2003) correlated .94, indicating stable item rankings. Apparently, items that had been scored relatively high, medium or low in 1989 were scored similarly in 2003.

Table 3.2: Estimated means and percentages of explained variance of significant effects on CBCL item scores.

Item*	Means		Year[1]	Gender[2], Age[3], SES[4] and Ethnicity[5]
	1989	2003		
1. Aches	0.19	0.11	<1 -	
4. Avoids eye contact	0.24	0.33	<1 +	Age=1[b]
6. Can't sit still	0.84	0.57	3 -	SES=2
24. Doesn't eat well	0.71	0.58	<1 -	SES<1
33. Feelings hurt	0.65	0.42	3 -	Age=1[b], SES<1
36. Gets into everything	0.86	0.72	<1 -	
38. Trouble sleeping	0.28	0.39	<1 +	Gender<1
41. Holds breath	0.09	0.03	<1 -	
42. Hurts accidentally	0.33	0.18	2 -	Gender<1, Age=1[a]
43. Looks unhappy	0.05	0.01	<1 -	
56. Clumsy	0.14	0.26	2 +	
58. Punishment doesn't change	0.62	0.48	<1 -	Gender=2, SES<1
59. Quickly shifts	0.99	0.82	1 -	SES=2
60. Skin problems	0.18	0.28	<1 +	
62. Refuses active games	0.31	0.01	5 -	SES<1
63. Rocks head, body	0.09	0.02	<1 -	
64. Resists bed	0.22	0.46	4 +	SES<1, Eth=1
68. Self-conscious	0.28	0.18	1 -	Age=1[b], SES=2, Eth=1
70. Little affection	0.09	0.02	1 -	
73. Shy	0.57	0.29	5 -	Age=1[b]
74. Sleeps little	0.25	0.13	1 -	
77. Stares	0.11	0.20	1 +	Gender<1, SES=2
78. Stomach aches	0.06	0.16	2 +	Age=2[b]
82. Moody	0.40	0.28	<1 -	
83. Sulks	0.55	0.24	7 -	SES<1
87. Fearful	0.22	0.13	1 -	
90. Sad	0.05	0.02	<1 -	SES=2
91. Loud	0.40	0.28	1 -	Gender=1, SES=3
95. Wanders away	0.01	0.28	4 +	Gender<1
97. Whining	0.43	0.73	5 +	

* Only the items are displayed on which ANCOVAs showed significant effects of year.

[1] ' + ' indicates an increase and ' - ' indicates a decrease in mean scores between 1989 and 2003.

[2] All effects of gender indicate higher scores for boys.

[3] [a] =higher scores for 2-year-olds, [b] =higher scores for 3-year-olds.

[4] Effects of SES indicate higher scores among low-SES children.

[5] Effects of ethnicity indicate higher scores among non-Dutch children.

[5] Effects of ethnicity indicate higher scores among non-Dutch children.

Table 3.3: Estimated means and percentages of explained variance of significant effects on CBCL scale scores.

	Means		Percentages of explained variance				
	1989	**2003**	**Year**[1]	**Age**[2]	**Gender**[3]	**SES**[4]	**Eth**[5]
Syndrome Scales							
Emotionally Reactive	2.30	2.15	-	-	-	<1	<1
Anxious/Depressed	2.10	1.59	2	1	-	4	1
Somatic Complaints	2.03	1.86	-	-	-	<1	3
Withdrawn	1.43	1.19	-	-	-	1	<1
Sleep Problems	2.23	2.41	-	-	-	-	1
Attention Problems	2.61	2.41	-	-	-	3	-
Aggressive Behavior	11.55	10.84	-		2	2	-
Broadband scales							
Internalizing	7.86	6.80	<1	<1	<1	2	2
Externalizing	14.16	13.25	-	-	2	2	-
Total Problems	33.24	30.52	<1	<1	-	3	1
DSM-oriented scales							
Affective Problems	2.10	1.85	-	-	-	<1	1
Anxiety Problems	2.52	2.42	-	-	-	1	2
Pervasive Developmental Problems	2.93	2.91	-	-	-	-	-
Attention Deficit/ Hyperactivity Problems	5.27	4.64	1	-	-	3	-
Oppositional Defiant Problems	4.55	4.47	-	1	-	<1	-

[1]All effects indicate higher mean scores in 1989.

[2]All effects indicate higher scores for 3-year-olds.

[3]All effects indicate higher scores for boys.

[4] Effects of SES indicate higher scores among low-SES children.

[5] Effects of ethnicity indicate higher scores among non-Dutch children.

Table 3.4: Estimated percentages of children scoring in the deviant range

	1989	2003
Syndrome Scales	%	%
Emotionally Reactive	12.4	12.5
Anxious/Depressed	20.1	11.6*
Somatic Complaints	9.3	10.4
Withdrawn	19.6	14.9
Sleep Problems	12.3	8.8
Attention Problems	17.8	12.9
Aggressive Behavior	7.6	7.7
Broadband scales		
Internalizing	22.2	15.3*
Externalizing	23.6	18.0
Total Problems	21.2	14.0*
DSM-oriented scales		
Affective Problems	10.6	9.1
Anxiety Problems	16.8	11.9
Pervasive Developmental Problems	8.7	8.3
Attention Deficit/Hyperactivity Problems	15.0	6.4*
Oppositional Defiant Problems	11.8	11.9

* Logistic regressions show a significant effect of year, indicating that the odds of scoring in the deviant range were significantly lower in 2003 than in 1989.

Discussion

In this study we investigated the 14-year secular change in parent-reported emotional and behavioral problems of 2- and 3-year-olds in the Dutch population. Our findings indicate that the problem scores for preschoolers in 2003 were similar to those in 1989. A few small changes were found in scale scores, indicating lower parent-reported problem scores among 2003 very young children than among their 1989 counterparts. This was the case for Total Problems, Internalizing, Anxious/Depressed and DSM-oriented Attention Deficit/ Hyperactivity Problems. These findings were supported by significantly lower proportions of children scoring in the deviant range of these problem scales in 2003 than in 1989. The trends were similar for boys and girls and for 2- and 3-year-olds. The stability of the item rankings indicated that parents had been consistent in the items they had scored lowest, intermediate and highest in both years under investigation.

Because this study was the first to investigate secular changes in very young children's parent-reported problems, we can only compare our results with similar studies that focused on other age groups. To some extent, our findings contradict the literature on trends in school-age children and adolescents. Although trends in school-age children have been investigated in different ways, most focused on

changes in the prevalence rates of diagnoses or treatment data. In contrast to our findings, these have suggested increases in the prevalence of ADHD, depression and autism among school-age children, and also in medication use and in the number of children hospitalized for a psychiatric illness (Croen et al., 2002; Fombonne, 2001; Gurney et al., 2003; Olfson et al., 2003; Webb et al., 1997). A methodological problem with such studies, however, is that diagnostic criteria may have changed over time. Also, treatment data do not necessarily represent changes in problem levels in the general population. The use of such studies as a frame of reference for school-age children's secular changes can therefore be questioned. Comparison of our findings with the results of such studies is also complicated by the fact that we did not use diagnostic instruments, but rating scale scores associated with these diagnoses.

Another way in which secular trends have been investigated in school-age children is by comparing identical assessments in representative population samples at different points in time, as we did in this study. The findings of such studies are inconclusive. Although Achenbach et al. (2003) and Sourander et al. (2004) found small decreases in problems among school-age children during the 1990s, we found small increases in Dutch school-age children's problems between 1983 and 2003 (Tick et al, in press, Chapter 2). This is not in line with the few decreases among very young Dutch children that we found in this study.

A possible explanation for the difference between our results for very young children and our results for school-age children may lie in the samples or instruments used. With regard to the samples, the 1989 sample was selected with a somewhat different selection method than the other samples (Koot and Verhulst, 1991), which may have influenced the results. However, all samples that were used to investigate parent-reported changes, for both the school age and the very young age, were randomly selected from the same region; the province of Zuid-Holland. One may wonder how large an effect of sampling method would be, especially since we were able to correct for effects of socio-economic status and ethnicity. Regarding the instruments, although the CBCL-1½ /5 is a valid and reliable checklist (Achenbach and Rescorla, 2001a), rating scale scores cannot be equated with psychiatric diagnoses (Carter et al., 2004). However, in both Dutch studies on school-aged children (Tick et al., in press) and 2- and 3-year-old children the CBCL was used, which enhances the comparability between these two studies.

Another explanation for the differences in secular changes between school-age children and very young children is that secular changes are indeed different for these two age groups, and that increases in problem scores are determined by factors that influence school-age children more than very young children. These very young children are less directly confronted with societal changes outside the family. They do not have the cognitive capacity to process information on all outside stressors, and the family context is central to them. Unfortunately, we did not collect data to evaluate the effects of societal developments.

Although our study aimed to investigate the presence of secular changes, it is hard to explain the presence or absence of such changes. Many developments in society take place at a more distal and proximal level. When secular changes are discussed, the focus is mostly on developments that are thought to have a negative influence on children's functioning. However, developments that may have a positive effect on very young children's well-being also occur in our society. For example, economic growth benefits the environment of children. Similarly, as more becomes known about children's mental health problems, prevention and intervention projects are developed. When secular changes or explanations for secular changes are to be explored, both positive and negative developments need to be kept in mind.

When we compare our results with results from earlier time-trend research conducted in other countries, it is difficult to obtain a clear picture. One may therefore question whether results from one society can be generalized to another, since several studies with comparable designs and instruments have shown varying findings (Achenbach et al., 2003; Collishaw et al., 2004; Sourander et al., 2004; Tick et al., in press, Chapter 2). However, many influences that are believed to have an impact on children, such as political tension, changing family structures, and changing societal distributions, are taking place throughout the Western world.

The common finding of all studies that used identical assessments in different samples is that they indicated only small changes. To a certain extent, such studies thus tend to counterbalance those that find large increases in diagnoses or treatment. To explore this further, future research should be conducted that takes account of standardized diagnostic interviews. Research focusing also on the very young age range is especially needed, as secular changes appear to differ not only across cultures, but also across different age groups. Knowledge of age-related differences and cross-cultural differences may bring us one step further towards identifying the mechanisms underlying secular changes.

Limitations

One limitation of our study concerns a number of differences between the 2003 and 1989 samples. First, in 2003, the response rate (80.5%) was lower than in 1989 (90.3%). In 2003 we also excluded 8.2% of the sample because their parents did not speak Dutch well enough to participate; most were low-SES Turkish and Moroccan immigrants. Next, our two samples differed in that fewer low-SES children and more non-Dutch children participated in 2003 than in 1989. Although we were able to control for these variables, these differences may nonetheless have influenced our results.

The greater participation of non-Dutch children reflects the continuous changes taking place in Dutch society, especially its increasingly multiethnic character. This may pose a problem for epidemiological studies: when investigating psychopathology in young children, it is important to taken the

cultural context into account, as cultural factors may play a role in the way parents complete the instruments (Carter et al., 2004). The difference between the 1989 and the 2003 samples with regard to the proportions of non-Dutch participants is nonetheless greater than one would expect. Suspecting that selective exclusion may have played a role in 1989, when this proportion was relatively low, we repeated the analyses both without controlling for ethnicity and without including the non-Dutch participants. These analyses revealed similar results, indicating that secular changes were not influenced by ethnic differences between the two samples.

Another limitation lies in the sampling procedures used for the two samples, the 1989 sample being drawn from the provincial inoculation register and the Rotterdam municipal health service, and the 2003 sample being selected from the municipal registers. Also, the fact that we used only checklist measures limited us from inferring the prevalence of psychiatric diagnoses in the population. Recently developed diagnostic interviews for very young children, such as the Preschool Age Psychiatric Assessment (Egger et al., 2006), which are based on diagnostic classification systems such as the ICD-10, DSM-IV and DC: 0-3, offer the opportunity to determine the prevalence of psychiatric disorders among preschoolers and can therefore be used in future research investigating changes in the prevalence of psychiatric diagnoses among very young children.

Yet another limitation is that we obtained information only from parents, who are often the only informants available for children in the very young age. Naturally, the children themselves are too young to provide self-reports, and many do not visit childcare facilities, so reports by other caregivers or teachers will often be unavailable.

Finally, over time, parents' perception of problems might also be subject to some change. Although the use of identical instruments at different time periods is an efficient way of studying time trends, the results may inevitably by influenced by (changes in) parent's perception bias.

Clinical implications

On the basis of the few small positive effects we found, it might be rash to conclude that very young children in 2003 had fewer problems than their counterparts in 1989. Our results do show, however, that in spite of all societal changes, there were no apparent increases in parent-reported problems. Very young children nonetheless continue to meet the criteria for problems that are based on a reliable checklist measure. The fact that ongoing research has shown that psychiatric problems can already be present at a very early age emphasizes the need for effective prevention and intervention programs that focus on very young children.

Inherent to the lives of all 2- and 3-year-olds is the fact that they will soon be attending elementary school. As the results of time-trend studies suggest, this is a transition that increases their vulnerability to several societal and socio-

economic changes. Parents, teachers, and mental health professionals should monitor these children and prepare them for these changes.

Furthermore, diagnostic instruments and the nosology of problems both need to be continuously developed and refined. The preferred method for gaining insight into the prevalence of young children's psychopathology is a multi-method, multi-informant approach that combines checklist measures with diagnostic instruments and observations, simultaneously taking different contexts into account (Carter et al., 2004); such an approach provides the best options for increasing our knowledge of the epidemiology of emotional and behavioral problems among very young children.

4 | Ten-Year Trends in Self-Reported Emotional and Behavioral Problems of Dutch Adolescents

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Submitted for publication

CHAPTER 4: Ten-Year Trends in Self-Reported Emotional and Behavioral Problems of Dutch Adolescents

Abstract

Research comparing population samples from different time periods to investigate secular changes in adolescents' psychosocial problems have mostly focused on parent and teacher reports. The few studies using self-reports have limitations, such as using only school-based samples or investigating a limited range of problems. We investigated changes from 1993 to 2003 in Dutch 11- to 18-year-olds' self-reported emotional and behavioral problems. We also examined whether trends were different for various socio-demographic groups. We used the Youth Self-Report to assess emotional and behavioral problems, and obtained self-reports of police contact, substance abuse, suicidal ideation and self-harm across two adolescent population samples, assessed in 1993 and 2003. To investigate whether reports were different for the two years, we performed analyses of variances on the mean scores, and chi-square analyses on the percentages of deviant-scoring children and children reporting specific problems. Logistic regressions were conducted to investigate interactions of year with various socio-demographic variables. Results showed a few small changes, indicating increases in self-reported Thought Problems and decreases in Externalizing, Aggressive Behavior, and Rule-Breaking Behavior. Drunkenness, drug use, self-harm and suicidal ideations increased. There were some differences between socio-demographic groups. The decreasing trends regarded mostly boys' functioning, and the increasing trend in alcohol use was strongest among girls. Also, only the Somatic Complaints scores of younger adolescents increased. Hence, this study showed evidence for some small trends in self-reported problems. Changes appeared to have affected adolescent girls' functioning most negatively.

Introduction

Times are changing, and so is the environment of adolescents. Information about secular trends in adolescents' emotional and behavioral problems can inform us if there is empirical ground for concerns about their well-being in this changing society. Such information is of importance for estimating service needs in the population and, subsequently, to develop an effective health service policy.

A valid and direct method to investigate secular changes in adolescents' emotional and behavioral problems is to compare problem levels of general population samples from different time periods that are assessed with identical measures (Maughan et al., 2005). Such studies have primarily used parent reports and teacher reports to gain insight in secular changes (Achenbach et al., 2002a, 2003; Collishaw et al., 2004; Maughan et al., 2005; Sourander et al., 2004; Verhulst et al., 1997b). However, in adolescence, self-reports are an important

source of information when investigating emotional and behavioral problems. A few studies have investigated secular changes in self-reported functioning over the past three decades, with varying results. Increases in self-reported internalizing problems have been found among adolescents in Greece and Scotland, but not in the US and Sweden (Achenbach et al., 2002b; Fichter et al., 2004; Wangby et al., 2005; West and Sweeting, 2003). In Sweden, antisocial problems increased, while in the US, a decrease in behavioral problems was seen (Achenbach et al., 2002b). Most of these studies, however, are hampered by limitations. They investigated only a narrow age range (Wangby et al., 2005; West and Sweeting, 2003), focused only on girls (Wangby et al., 2005), used school based samples (Fichter et al., 2004; Wangby et al., 2005), or assessed only a limited range of problems (Fichter et al., 2004; West and Sweeting, 2003).

Most studies on secular changes in self-reported emotional and behavioral problems have investigated overall levels of emotional and behavioral problems. They did not zoom in on specific problem behaviors that can have adverse consequences, such as self-reported delinquency, substance abuse, suicidal ideation, and self-harming behavior. With regard to such problem behaviors, several trends have been reported over recent decades, in the Netherlands as well as in other Western countries. Crime rates increased over the last half of the 20th century in the Western world (Smith, 1995), although a stabilizing trend was seen during the 90s (Maughan et al., 2005). During the 90s, an increase could be seen in excessive alcohol use among Dutch youngsters (Trimbos, 2007), and worries about the binge drinking habits of Western adolescents are often expressed (Maughan et al., 2005). Although drug use increased over past decades in the Western world, a stabilizing trend was recently identified in the Netherlands and the US (Poelen et al., 2005; Schiffman, 2004; Sheldon, 2000; Trimbos, 2007). Also, deliberate self-harming behaviors among young people appear to be on the rise in different Western countries (Fortune and Hawton, 2005). Some of these studies, however, are dependent on registration data of hospitals or the police. Often, only the most serious cases have been registered. Also, these trend studies have focused only on a specific area of behaviors and did not combine information a wide range of emotional and behavioral problems to gain insight in changes in adolescents' functioning.

Another important question is whether trends in adolescents' emotional and behavioral problems differ by age, gender, socioeconomic status (SES), and ethnicity. These are well-investigated socio-demographic variables that are shown to be associated with emotional and behavioral problems (Bengi Arslan et al., 1997; Bradley and Corwyn, 2002; Cyranowski et al., 2000; Lahey et al., 2000; Vollebergh et al., 2006). Such information shows us which groups are more at risk for secular changes than others. Previous studies that investigated trends in self-reported functioning by comparing population samples assessed with identical measures have not specifically addressed socio-demographic differences in trends. Some did examine gender differences. West and Sweeting (2003) found an

increase in emotional problems from 1987 to 1999 among Scottish 15-year-olds that was only apparent among girls.

Given the limited information available on secular changes in adolescents' self-reported emotional and behavioral problems, the aims of our study were: 1) To investigate the ten-year changes (1993-2003) in self-reported emotional and behavioral problems of Dutch adolescents in the general population; 2) To examine whether trends were different for various socio-demographic groups.

Method

Participants

For this study, we used two adolescent population samples, one assessed in 1993 and one in 2003. The following adolescents were excluded from the sample: those with intellectual disabilities or major physical disabilities, those whose parents did not speak Dutch, and those whose families left the study area. After complete description of the study to the subjects, written informed consent was obtained for subjects of each sample. The Medical Ethics Committee of the Erasmus Medical University Center approved each study

1993 Sample The 1993 sample originally consisted of 2,719 randomly selected 4- to 18-year-olds living in the Netherlands. Of the 2,719 eligible parents, 2,227 parents participated (81.9 %). Fourteen children were excluded from the sample. Of the 1,126 11- to 18-year olds whose parents participated, 1,120 (99.5%) provided self-report data. Of these, 25 fell out of the age range at the time of measurement. For an extensive description of the sample and procedure, see Verhulst et al. (1997a).

2003 Sample For the 2003 sample, 2,567 6- to 18-year-olds were randomly selected from the municipal registers of 35 municipalities in the Dutch province of Zuid-Holland. We excluded 250 children from the sample. Of the 2,317 eligible respondents, 1,710 (73.8%) parents participated. Of the 1,035 11- to 18-year-olds whose parents participated, 860 (83.1%) provided self-reports. Of these, 50 adolescents were 10- or 19-years old at the time of measurement. The present study included the remaining 810 11- to 18-years old. We tested whether the 11- to 18-year-olds who provided a self-report differed from those who did not provide a self-report with regard to their scores on the Child Behavior Checklist (CBCL), which their parents completed. Analyses revealed no significant differences.

While the 2003 sample was drawn from the province of Zuid-Holland, the 1993 sample was a national sample. We performed ANCOVAs on the data of the 1993 sample, with age, gender, socioeconomic status (SES) and ethnicity as covariates, to examine whether there were significant differences on the Youth Self-Report (YSR) syndrome scales between children living in Zuid-Holland and children living elsewhere in the Netherlands. Only one very small significant difference was found (effect size <1%), indicating that children in Zuid-Holland

had a lower mean Thought Problems score. We decided to use the entire 1993 sample and included the 1,095 11- to 18-year-olds.

Measures

Emotional and behavioral problems

The YSR is an instrument of the Achenbach System of Empirically Based Assessment (ASEBA) and has good reliability and validity (Achenbach and Rescorla, 2001b). Adolescents rate their behavior over the preceding 6 months, items being scored on a three-point scale, with responses: 0= not true, 1= somewhat or sometimes true, 2= very true or often true. The problem items are scored on eight empirically based syndromes that were derived by factor analyses: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior and Aggressive Behavior (Achenbach and Rescorla, 2001b). The first three syndromes are also scored on an Internalizing broadband scale, while the last two syndromes are scored on an Externalizing broadband scale. All problem items sum up to a Total Problems score. Because the ASEBA questionnaires were revised in 2001, we only used the items that were on both pre-2001 and 2001 editions. We therefore excluded 5 items. One item in the pre-2001 edition of the YSR was: 'I use alcohol or drugs'. In 2003, alcohol and drug use were two separate questions ('I use alcohol' and 'I use drugs'). We calculated a combination score of these two items for the 2003 sample, determined by the highest score of the two questions. We regarded this combination score as the counterpart of the pre-2001 YSR-question pertaining to alcohol and drug use.

We also assessed the following specific problems: police contact, excessive alcohol use, drug use, suicidal ideation, and deliberate self-harm. Similar questions were asked in 1993 and in 2003. We asked adolescents if they had been in contact with the police as a result of their behavior (minor traffic offences not counted) during the past twelve months (1=yes versus 0=no). Regarding substance abuse, adolescents were asked whether they had been drunk during the past six months (1= never, 2= 1 or 2 times, 3= 3 or 4 times, 4= 5 or 6 times, or 5= more than 6 times). We dichotomized the scores (1=yes versus 0=no). Subsequently, adolescents were asked whether they used drugs (marihuana, hash, cocaine, heroine, speed/amphetamines, ecstasy, LSD, GHB, other) during the past six months (1=yes versus 0=no). To assess suicidal ideation, adolescents were asked if they had considered ending their lives during the past year (1=yes versus 0=no). To assess self-harm behavior, adolescents were asked whether they tried to kill or hurt themselves during the past year (1=yes versus 0=no).

Socio-demographic characteristics

The samples were divided into 2 age groups: 11- to 14 years, and 15- to 18 years. Information on SES and ethnicity was obtained from the parents. As indicators for SES, we used parental occupational status and parental educational level. For

the 1993 sample, parental occupational status was determined according to van Westerlaak's 6-step scale of occupation (Van Westerlaak et al., 1975), and subsequently divided into two occupation levels (low parental occupation; 1 and 2 and middle/high parental occupation; 3,4,5, and 6). For the 2003 sample, we used the Standard Classification of Occupations (CBS, 2001), which discerns five levels of occupation. We made a comparable 2-category distribution (low parental occupation: elementary and lower occupations; middle/high parental occupation: middle, higher and scientific occupations). For parental educational level, we made a two-category distribution: low parental education versus middle or high parental education. Ethnicity was classified as Dutch or non-Dutch. Children with at least one parent born outside the Netherlands were classified as non-Dutch. Compared to the 1993 sample, the 2003 sample contained fewer children from families with low parental education or with low parental occupation, and more children with a non-Dutch ethnic background (Table 4.1).

Table 4.1 Demographics

Sample	**1993** % *n=1095*	**2003** % *n=810*	χ^2 **p-value** *(df=1)*
Gender			
Boy	49.9	47.3	
Girl	50.1	52.7	.244
Age group			
10-14 years	49.8	49.1	
15-19 years	50.2	50.9	.760
Parental Occupation			
Low Occupation	29.0	24.4	
Middle/high Occupation	71.0	75.6	.024
Parental Education			
Low	47.6	26.9	
Middle/ High	52.4	73.1	.000
Ethnicity			
Dutch	91.8	79.7	
Non-Dutch	8.2	20.3	.000

Statistical analyses

We performed 2 (year) x 2 (gender) x 2 (age group) ANCOVAs on the syndrome scales, the broadband scales and the Total Problems scale in order to test for differences in the mean scale scores ($p<.05$, two-tailed). We used ethnicity and the SES indicators: parental education and parental occupation as covariates. We report estimated means, which are means that are adjusted for the effects of

covariates. Given that we used large samples, we report the percentages of explained variance, indicating the effect size (ES), for the significant effects of year. An ES of 1 to 5.9% is considered small, an ES of 6 to 13.8% medium, and an ES exceeding 13.8% large (Cohen, 1988).

To investigate whether the percentages of children with serious emotional and behavioral problems changed from 1993 to 2003, we examined whether the percentage of children scoring in the deviant range of the scales changed significantly. We first calculated cut-off scores on the YSR problem scales for boys and girls separately. In line with Achenbach and Rescorla (2001b), children having a Total Problems, Internalizing or Externalizing score in the 84th percentile of the norm group or higher were classified as having serious problems, since they scored in the deviant range of the scales. With regard to the syndrome scales, children scoring in the 93rd percentile or higher were classified as having serious problems. We conducted chi-square tests to examine whether the percentages of deviant-scoring adolescents differed significantly between 1993 and 2003. We also conducted chi-square tests to investigate whether the proportions of children that scored positively on drunkenness, drug use, police contact, suicidal ideation or self-harm differed significantly between 1993 and 2003.

To investigate whether trends were different for different socio-demographic groups, we performed logistic regressions on having serious problems on the different YSR scales and on the specific problem behaviors. We conducted five different logistic regressions on each of the outcomes in which we included the five socio-demographic variables and one of the following interaction effects: year by age group, year by sex, year by parental educational level, year by parental occupational status, or year by ethnicity.

Results

Trends in self-reported emotional and behavioral problems

Five out of 17 scales showed a significant effect of year (Table 4.2). Mean scores on the Social Problems and Thought problems scales increased, whereas scores on the Rule-Breaking Behavior, Aggressive Behavior and Externalizing scales decreased. However, none of these changes reached the size of a small effect according to Cohen (1988). The proportion of deviant scoring children increased significantly for the Thought Problems scale, but decreased significantly for the Aggressive Behavior and the Externalizing scales (Table 4.2).

Table 4.2: YSR estimated means, effect sizes (ES) for significant effects of year, and percentages of deviant-scoring children

	Estimated Means			% Scoring deviant		
	1993	2003	ES[1]	1993	2003	χ^2 p-value *(df=1)*
Syndrome Scales						
Anxious/Depressed	4.4	4.2	-	9.4	9.0	.769
Withdrawn/Depressed	2.5	2.7	-	13.4	13.0	.769
Somatic Complaints	2.8	2.9	-	11.7	12.6	.550
Social Problems	3.5	3.2	0.3 %	12.8	11.9	.541
Thought Problems	2.6	3.1	0.8 %	8.0	12.1	.003
Attention Problems	3.8	3.8	-	13.2	12.8	.797
Rule-Breaking Behavior	3.8	3.4	0.4 %	11.6	8.9	.056
Aggressive Behavior	5.9	5.2	0.6 %	10.8	7.7	.021
Broadband Scales						
Internalizing	9.7	9.8	-	19.7	19.5	.905
Externalizing	9.7	8.7	0.7 %	22.5	14.7	.001
Total Problems	33.5	32.7	-	18.3	16.4	.295

[1] Percentages of explained variance of significant ($p<.05$) effects of year.

The proportions of children who indicated suicidal ideation, self-harm behavior, drunkenness, or drug use increased significantly from 1993 to 2003 (Table 4.3).

Table 4.3: Changes in percentages of children that reported serious problems

	1993 %	2003 %	χ^2 p-value *(df=1)*
Police contact	6.8	7.6	.501
Drunkenness	12.1	24.2	.000
Drug use	5.5	10.6	.000
Suicidal ideation	3.2	5.2	.025
Self-harm	2.4	4.1	.035

Socio-demographic differences

Logistic regressions revealed several overall effects of socio-demographic variables on self-reported problems (data not shown). Older adolescents (15- to 18-year-olds) more often scored in the deviant range than younger adolescents (11- to 14-year-olds) on the Withdrawn/Depressed, Rule-Breaking Behavior, Externalizing, and Total Problems scales, and more often reported police contact, drug use, and alcohol use. Effects of gender indicated that girls more often had serious Somatic

Complaints problems, and reported more suicidal ideation or self-harm than boys. They less often had serious Aggressive Behavior problems. Adolescents with low parental education less often had serious Thought Problems than those with medium/high parental education, whereas adolescents with low parental occupation more often had serious Aggressive Behavior problems than adolescents with medium/high parental education. Non-Dutch children reported less drug use and drunkenness than Dutch children.

Different trends in different socio-demographic groups

Several significant interaction effects indicated different trends for different socio-demographic groups. Most of these effects indicated different trends for adolescent boys and girls. As Table 4.4 indicates, the proportions of children with serious Social Problems, Rule Breaking Behavior and Total Problems decreased for boys, whereas they remained stable for girls. With regard to drunkenness, the increase was much stronger among girls than among boys.

We identified a few other significant interaction effects (data not shown in table). The proportion of children with serious Somatic Complaints problems increased for young adolescents (OR 2003 versus 1993: 1.67, $p<.05$), but not for older adolescents (OR: 0.71, not significant). Other interactions indicated that opposing trends were seen for children with low parental education, for whom the proportions of serious Somatic Complaints and police contact increased, versus children with medium or high parental education, for whom these proportions decreased. However, these separate trends were not significant. No interactions of ethnicity by year were seen, indicating comparable trends for Dutch and non-Dutch adolescents.

Table 4.4 Odds ratios (OR) for boys and girls for scales that indicated significant ($p<.05$) interaction effects of year by gender

	OR 2003 versus 1993	
	Boys	**Girls**
YSR Social Problems	0.58 (CI: 0.38-0.90)	1.24 (CI: 0.84-1.82)
YSR Rule-Breaking Behavior	0.53 (CI: 0.33-0.86)	1.02 (CI: 0.66-1.56)
YSR Total Problems	0.53 (CI: 0.36-0.78)	1.17 (CI: 0.83-1.64)
Drunkenness	1.68 (CI: 1.17-2.44)	6.16 (CI: 3.97-9.56)

Discussion

In this study, we investigated secular changes from 1993 to 2003 in self-reported emotional and behavioral problems among Dutch adolescents. We did not find strong evidence for consistent trends. Small trends were found for a few subscales, indicating an increase in thought problems and a decrease in social problems. The proportion of children with serious externalizing problems also decreased.

However, the prevalence of several specific problem behaviors increased. Results indicated that trends did not differ much for different socio-demographic groups, although we did find some differences between boys and girls.

We found that self-reported internalizing problems did not change from 1993 to 2003. The findings from other studies that examined secular changes in self-reported emotional problems are mixed. Achenbach et al. (2002b) found a small decrease in anxiety problems from 1989 to 1999 among American adolescents. Wangby et al. (2005) found no changes in emotional problems from 1970-1996 among 15-year-old adolescent girls, whereas West and Sweeting (2003) found an increase from 1987-1999 among Scottish girls. Fichter et al. (2004) found an increase in emotional problems from 1980-1998 among Greek adolescents.

Although the overall self-reported emotional problems did not increase, we found evidence for an increase in self-reported self-harm and suicidal ideation. These findings are supported by findings from previous studies, indicating that deliberate self-harm is increasing among adolescents in different Western countries (Fortune and Hawton, 2005).

With regard to externalizing problems, we identified a small decrease in children with serious self-reported externalizing problem scores from 1993 to 2003. This was mainly due to a decrease among boys. Only two other studies investigated secular changes in self-reported externalizing problems, with inconsistent findings. Achenbach et al. (2002b) found a small decrease from 1989 to 1999 in self-reported Oppositional Defiant Problems among American adolescents (Achenbach et al., 2002a, 2002b, 2003), whereas Wangby et al. (2005) found an increase from 1970 to 1996 in the percentage of Swedish girls with serious self-reported antisocial problems.

In this study, we found evidence that self-reported drunkenness has increased from 1993 to 2003. This is in line with the often-expressed worry of an increased number of children engaging in binge drinking in several Western countries (Maughan et al., 2005). We also found evidence for an increase in drug use. This seems to contradict findings of other studies, as these have shown a stabilizing trend in recent years with regard to drug use among youngsters in the Netherlands and the US (Schiffman, 2004; Sheldon, 2000; Trimbos, 2007). However, we focused on a broad, ten-year time period and we do not know how this trend has developed within these ten years. An initial increase in drug use may have been followed by a decrease.

We found a small increase in self-reported thought problems and a small decrease in self-reported social problems. The decrease in social problems was mostly due to a decrease among boys. No secular changes were seen among American adolescents with regard to these problems (Achenbach et al., 2002b). No other studies comparing population samples have investigated changes in self-reported social or thought problems.

We found that some changes were different for different socio-demographic groups. The somatic complaints scores increased from 1993 to 2003 for younger adolescents, but not for older adolescents. Most differences concerned differences between boys and girls. The proportion of adolescents with deviant scores on rule-breaking behavior, social problems and total problems decreased only among boys. Also, girls appear to have caught up with boys regarding excessive alcohol use. Some other studies have also shown gender differences in secular changes. Gender-specific trends in self-reported problems were also found among Scottish adolescents from 1989 to 1999 (West and Sweeting, 2003). Also, previous studies have shown that the differences in substance use between males and females are decreasing, in the Netherlands (Poelen et al., 2005; Trimbos, 2007), and other Western countries (McPherson et al., 2004; Plant, 2001).

A gender convergence has been proposed by Rutter and Smith (1995). This gender convergence suggests that girls' and boys' problems are becoming more alike. However, although we found some gender specific changes, our findings cannot be considered strong evidence that adolescent girls and boys' problems are becoming more alike. It would also be rash to conclude that boys are doing better on the basis of the few small decreasing trends we found. It does appear, however, that the secular changes we identified in this study have most negatively affected the functioning of girls. Self-harm and suicidal ideation, which are most prevalent among girls, have increased. Moreover, girls' excessive alcohol use has shown a much stronger increase than that of boys. Also, the decreasing trends that were seen for boys' self-reported problems on several scales of the YSR did not apply to girls.

When comparing the findings from this study to findings from comparable studies using parent reports or teacher reports to investigate changes in adolescents' functioning, considerable differences between informants become apparent. In a previous study (Tick et al., in press; Chapter 2), we found parent-reported internalizing problems of Dutch adolescents to have increased from 1983 to 2003. No such a change could be identified in the self-reports. Also, Collishaw et al. (2004) found increases in British 15-year-olds' parent-reported conduct and emotional problems from 1976-1999. Achenbach et al. (2002b) found parent- and teacher reports of American's adolescents to be consistent with the decreasing trend they found in self-reports. Discrepancies between informants are seen in other time trends studies as well (Achenbach et al., 2002a, 2002b, 2003; Sourander, 2004).

This study also showed some differences between findings from studies from different countries. Such differences may have resulted from using different instruments. Also, the fact that we examined a more recent and smaller time period than other studies may have contributed to these differences.

This study is not without limitations. One limitation of this study concerns some differences between the 2003 sample and the 1993 sample. The response

rate of the 2003 sample was lower than that of the 1993 sample. This could have affected the results, since adolescents with more problems may not have participated. Although adolescents who provided an YSR did not differ from those who did not provide an YSR with regard to their level of parent-reported problems, we have no information on the adolescents whose parents did not participate. Secondly, 7.2% of the children selected for the original 2003 parent sample were not assessed, because their parents did not speak Dutch. This limits the generalizability of our results to the Dutch-speaking part of the population. The non-Dutch group in our sample may not be the best reflection of the non-Dutch part of the Dutch population. Most of the excluded children were low-SES Turkish and Moroccan immigrants. They may have had more serious problems, since studies have found some evidence that Turkish or Moroccan children living in the Netherlands have more problems than Dutch children (Janssen et al., 2004; Stevens et al., 2003; Bengi Arslan et al., 1997).

In this study, we found some trends in self-reported overall emotional and behavioral problems among adolescents from 1993 to 2003. Thought problems, substance abuse, suicidal ideation, and self-harm increased, whereas externalizing problems showed a small decrease, mainly among boys. Some trends were gender specific, and changes most negatively affected girls' functioning. However, there appears to be cross-informant and cross-cultural variation in time trends. Since ten years are only a short period of time, further developments need to be monitored in different countries, using comparable instruments that assess a wide array of problems.

5 | Differential Item Functioning in the Assessment of Children's Emotional and Behavioral Problems in 1983 and 2003

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Submitted for Publication

CHAPTER 5: Differential Item Functioning in the Assessment of Children's Emotional and Behavioral Problems in 1983 and 2003

Abstract

To investigate secular changes in children's emotional and behavioral problems, several studies have compared samples from different time points that were assessed with similar questionnaires. Changes over time in respondents' response tendencies may influence the validity of the findings of such studies. We investigated whether items of the Child Behavior Checklist (CBCL) and Teacher's Report Form (TRF) functioned differently for two population samples that were assessed twenty years apart, by conducting differential item functioning (DIF) analyses. We performed ordinal logistic regressions on the CBCL and TRF item scores. Only three CBCL items and three TRF items displayed DIF. This DIF was only present when a conservative criterion was used. The DIF-displaying TRF items all belonged to the Attention Problems subscale. These results indicate that DIF does not influence the validity of comparing assessments of emotional and behavioral problems in children that were obtained from samples from different time points.

Introduction

A direct way to investigate secular changes, i.e. changes in population prevalences occurring over time, in children's emotional and behavioral problems is to compare population samples from different time points, that were assessed with identical measures (Maughan et al., 2005). Several such studies have been conducted (Achenbach et al., 2002a, 2002b; Achenbach et al., 2003; Collishaw et al., 2004; Sourander et al., 2004). However, the way people complete questionnaires may be subject to change over time. If this is the case, differences in scores may appear between samples from different time periods that are not due to actual changes in problem levels, but are due to changes in the way the respondents were biased to answer the questions. This would complicate the validity of the conclusions drawn from the results. It is therefore important to investigate whether changes in the way respondents tend to complete the questionnaires, i.e. their response tendency, affect the results of time trend studies.

Several developments may influence the comparability of questionnaires that are completed by samples from different time points. The language that is used to describe the items may be more common for samples from certain time periods than for samples from other time periods. This may affect the completion of the questionnaire, as people from this specific time period respond better to certain words, and may therefore be more inclined to endorse the item. Also, people from different time periods may differ in their knowledge of the behavior

that is questioned. If increased attention is paid in the media to certain behaviors or symptoms of diagnoses, this may cause such a difference. Enhanced knowledge may affect the respondent's judgment, as it influences the way he or she perceives specific behaviors, interprets the questions, or is susceptible to the language used. As a result of such developments, respondents from different time points may have differ response tendencies when answering certain items.

To determine that such effects have not influenced the completion of comparable questionnaires at different points in time, the items of these questionnaires must be shown to operate comparably for the different samples under investigation. This would indicate that there is measurement invariance. Measurement invariance means that the relation between the items and the trait of interest is invariant among groups (Reise et al., 1993). If the relation between an item and the trait of interest is different for different groups, then the item may be biased to 'prefer' one group over the other. One group then is unfairly more likely to endorse the item than another group (Clauser and Mazor, 1998).

Items of the questionnaires that have been used to assess emotional and behavioral problems may be biased for the samples from different time points, as a result of the influences specified earlier. For example, parents in 2003 may know more about a certain behavior than parents in 1983. Results may show that parents in 2003 were more likely to endorse an item that describes this behavior than parents were in 1983, at the same level of underlying problems. If this is the case, the item was not necessarily more often endorsed in 2003 because the behavior was more prevalent, but probably because the parents were better able to judge this behavior as a result of increased knowledge or familiarity with the behavior. An issue of measurement is at stake here, since the item seems biased to 'prefer' the 2003 parents over the 1983 parents, at the same level of underlying problems. It is important to determine whether such item bias has affected the validity of studies that investigated secular changes in children's psychosocial problems by comparing samples from different points in time that were assessed with similar questionnaires.

A way to gain insight in the presence of item bias is to study differential item functioning (DIF) in the items of the questionnaires used. DIF is present when different groups have different likelihoods of endorsing the item, after they have been matched on the trait of interest. DIF can be uniform and non-uniform, depending on the type of item parameter that differs across groups (Mellenbergh, 1994). The two parameters of interest are item difficulty and item discrimination. Item difficulty is a location parameter that refers to the underlying trait and the likelihood of a certain response (Chan, 2000). It indicates at which level of the underlying trait the likelihood of endorsing the item increases. Item discrimination refers to the extent to which an item is able to distinguish between individuals scoring high and low on the underlying trait (Chan, 2000). If the item discrimination is low, people with high and low levels of the underlying trait have a comparable likelihood of endorsing the item (Zumbo, 1999). Uniform DIF

exists when only the item difficulty parameter differs between groups, whereas non-uniform DIF exists when the item discrimination parameter differs across groups, which is indicated by an interaction between ability level and group membership (Chan, 2000). If DIF is present for many items, this influences the validity of the assessment.

If items show DIF for samples from different time points, several factors, such as small changes in the wording of the items or an increased knowledge of the behavior, may have caused this DIF. It could also be that the relation between the item and the underlying problem dimension has changed because the behavior has indeed become more common or less common over time, at equal levels of the underlying problems. If a certain item had a higher likelihood to be endorsed by respondents in the most recently assessed sample, this could be the result of a change in the environment that has contributed to an increased prevalence of this behavior. For example, if the legal age to drink alcohol has dropped between the two times of assessment, alcohol use may have become more prevalent and more accepted among adolescents. An item pertaining to alcohol use has then become less indicative for rule-breaking behavior problems.

To find out whether the validity of comparing assessments from samples from different points in time is affected by DIF, we investigated whether the items of the Child Behavior Checklist (CBCL) and the Teacher's Report Form (TRF) functioned differently for two population samples that were assessed twenty years apart.

Method

Participants

For this study we used data on two general population samples. One sample was assessed in 1983, the second in 2003. A Medical Ethics Committee approved each study. The age range differed for the two samples under investigation. To enable comparison between the two samples, we used only parent reports for 6- to 16-year-olds and teacher reports for 6- to 12-year-olds.

1983 Sample The 1983 sample consisted of 2,447 randomly selected 4- to 16-year-olds living in the province of Zuid-Holland. Data collection took place between February 1983 and May 1983. Of the eligible parents, 2,076 (84.4%) completed the CBCL. TRFs were obtained for 1,067 (83.8%) of the 1,273 4 to 12-year-olds whose parents gave their written permission. For an extensive description of the sample and procedure see Verhulst et al. (1985). The present study included 1,735 6- to 16-year-olds with valid CBCLs and 902 6- to 12-year-olds with valid TRFs.

2003 Sample The 2003 sample consisted of 2,567 randomly selected 6- to 18-year-olds, living in the Dutch province of Zuid-Holland. Data collection took place between December 2003 and April 2005. Of the 2,317 eligible respondents,

1,710 (73.8%) parents participated. Subsequently, 786 (87.2%) parents of the 901 6- to 12-year olds children attending school gave written consent to send the TRF to the child's teacher. Completed TRFs were obtained for 719 (91.5%) children. For more information on the sample and the procedure see Tick et al. (in press, Chapter 2).

Table 5.1 shows the socio-demographics of the two samples. Compared to 1983, fewer children from low SES families and from a non-Dutch ethnic background participated in 2003.

Table 5.1: Demographics

Sample	**1983** *(n=1735)*	**2003** *(n=1417)*
Gender		
Male	49.0%	49.8%
Female	51.0%	50.2%
Age		
6-8 years	28.2%	25.7%
9-11 years	27.6%	28.2%
12-14 years	27.4%	27.7%
15-16 years	16.8%	18.4%
SES*		
Low	33.8%	23.7%
Middle	32.3%	40.6%
High	33.9%	35.7%
Ethnicity**		
Dutch	96.9%	78.3%
Non-Dutch	3.1%	21.7%

* Significantly different SES distribution (more low SES participants) in 1983 than in 2003 (χ^2=42.68, df=2, p<0.001).

** Significantly more non-Dutch participants in 2003 than in 1983 (χ^2=265.92, df=1, p<0.001).

Procedure

Parents were sent letters describing the study. After a couple of weeks, they were contacted by telephone or visited at home and were asked whether they agreed to participate in the study. If parents agreed to participate, a student visited them and conducted an interview that contained the CBCL. Students had received a training to conduct the interviews. After complete description of the study to the subjects, written informed consent was obtained for the participating subjects. After the interview, parents were asked permission to send a questionnaire to the

child's teacher. If permission was given, a questionnaire containing the TRF was sent to the child's teacher.

Measures

The CBCL and TRF are interrelated questionnaires, shown to have good reliability and validity (Achenbach and Rescorla, 2001b). The problem items are scored on a 3-point scale, with responses: 0= not true, 1= somewhat or sometimes true, 2= very true or often true. On the CBCL, parents rate the child's problems over the preceding 6 months. On the TRF, teachers rate the child's problems over the preceding 2 months. The problem items on these questionnaires are scored on 8 empirically based syndromes that were derived by factor analyses and are similar across the CBCL and the TRF: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior (Achenbach and Rescorla, 2001b). The first three syndromes are also scored on a broadband scale designated as Internalizing, while the last two syndromes are scored on a broadband scale designated as Externalizing. Because the ASEBA questionnaires were revised in 2001, we used only the items that were on both pre-2001 and 2001 editions. For our DIF analyses, we used only the 97 CBCL items and the 109 TRF items that belonged to a syndrome scale. The syndrome scale score represents the underlying trait.

Statistical analyses

Methods for detecting DIF in binary items have been well studied and developed (Clauser and Mazor, 1998; Langenfeld, 1997; Zwick et al., 1993). More recently, several detection methods for DIF in ordinal items have been studied (Kristjansson et al., 2005). Ordinal logistic regression, previously proposed by Miller and Spray (1993), and described in detail by Zumbo (1999), appears to be a useful method to detect DIF in ordinal items (Kristjansson et al., 2005). Since the problem items in the ASEBA questionnaires are measured on an ordinal scale, this procedure can be used to study possible DIF in the items of the ASEBA questionnaires for the samples from different time periods.

Three ordinal logistic regressions were performed on each CBCL and TRF item. First, only the trait variable (syndrome scale score) was entered. Next, the grouping variable (year of assessment) was added. Finally, the interaction-term (scale score by year of assessment) was added. To test for DIF, we regarded the change in χ^2 between the regression with only the trait variable, and the regression that included the grouping variable and the interaction term as well. We also regarded the difference in R^2 between these regressions. We included sex, age group, SES, and ethnicity as covariates in our analyses. Adding the final interaction term informed us to what extent the DIF is attributable to non-uniform DIF.

Zumbo (1999) comments that DIF can be regarded as present when there is a significant change in χ^2 (df=2, p<.01), accompanied by a change in R^2 of .130 (the Zumbo-Thomas Effect Size). However, other authors have used a more conservative effect size for items to play DIF (Gierl et al., 1999). They judge a change in R^2 of less than .035 as negligible, a change <.035-.070 as medium, and a change in R^2 of >.070 as large. We will use the latter, more conservative criterion to judge DIF.

Results

CBCL items

Of the 97 CBCL items, 54 items displayed a significant change in chi-square value after adding the group variable and the interaction term to the ordinal logistic regression. However, 51 of these items showed negligible DIF (Change in R^2 value<.035). Three items (item 10; "Can't sit still", item 62;"Clumsy", and item 104;"Loud") displayed medium DIF (Table 5.2). All DIF was attributable to uniform DIF, since the amount of R^2 change due to non-uniform DIF was negligible (.001-.003).

As Table 5.2 shows, for one item (item 62; "Clumsy") the likelihood to positively answer the item was higher in 2003 than in 1993, when controlled for the underlying Social Problems level. For the two other DIF-displaying items (item 10; "Can't sit still" and item 104;"Loud"), the likelihood to positively answer the item was lower in 2003 than in 1983, when controlling for underlying problems levels.

Table 5.2: Differential Item Functioning in the CBCL and TRF

	CBCL			TRF		
Item (scale)	**χ^2 change**	**R^2 change**	**Beta**	**χ^2 change**	**R^2 change**	**Beta**
10. Cant' sit still (Attention Problems)	179.053	.040	-1.129	28.531	.013	-0.759
13. Confused (Attention Problems)	13.408	.007	-.617	55.531	.048	-1.175
62. Clumsy (Social Problems)	135.050	.050	1.262	8.120	.006	0.465
67. Disrupts (Attention Problems)	--[b]	--	--	92.646	.066	1.899
104. Loud (Aggressive Behavior)	153.537	.045	-1.276	17.264	.012	-0.737
109. Whining (Attention Problems)	--	--	--	43.307	.051	1.444

[a] df=2, sig <.01

[b] The item has no corresponding question on the other questionnaire

TRF items

Three items (item 18; "Harms self", item 91; "Talks of suicide", and item 105; "Uses drugs") could not be analysed, since there were too few teachers

who scored 1 or 2 on these items. Of the 105 TRF items that were analyzed, 32 displayed a significant change in chi-square value. However, 29 of these items showed negligible DIF (Change in R^2 value<.035). Two items (item 13; "Confused" and item 109; "Whining") displayed medium DIF, while one item (item 67: "Disrupts") displayed high DIF (Table 5.2). All DIF was attributable to uniform DIF, since the amount of R^2 change due to non-uniform DIF is negligible (.000-.015). For two items (item 67; "Disrupts" and item 109; "Whining") the odds to positively answer the item were higher for the 2003 than for the 1983 sample, when controlled for underlying problem level. For one item (item 13; "Confused") the odds to positively answer the item were lower for the 2003 sample than for the 1983 sample.

Discussion

We found that the large majority of items did not show DIF. Only three CBCL items and three TRF items displayed DIF. This indicates that these items have become either more indicative or less indicative for the underlying problems between 1983 and 2003, since they were differently related to the scale score in the two years of assessment. All DIF we found was uniform, meaning that for all DIF-displaying items, the item difficulty parameter, but not the item discrimination parameter differed between the two samples. Importantly, the DIF we found was only present according to the conservative criterion of effect size of Gierl (1999). If we had used the less conservative Zumbo-Thomas effect size (Zumbo, 1999), none of the items in the two questionnaires would have been judged to display DIF.

Four of the six items that displayed DIF (three TRF items and one CBCL item) belong to the Attention Problems subscale, one to the Aggressive Behavior subscale of the CBCL, and one to the Social Problems subscale of the CBCL. None of the internalizing items showed DIF. In a previous study we used these samples to examine the secular changes in parent and teacher-reported emotional and behavioral problems (Tick et al., in press, Chapter 2). We found that mainly internalizing problems showed a small increase from 1983 to 2003, which was most apparent in the parent reports. Teacher reports showed a small increase with regard to attention problems (Tick et al., in press, Chapter 2). Since the internalizing items did not show DIF, we can conclude that differential item functioning has not influenced our previous results regarding internalizing problems. Given that we found that only one externalizing item displayed DIF, we can also conclude that differential item functioning has not influenced our (lack of) findings with regard to externalizing problems much either.

The three items that displayed DIF in the TRF all belonged to the Attention Problems scale, which is the largest subscale of the TRF, containing in sum 26 items. For two items, the odds of endorsing the item at a comparable level of Attention Problems increased from 1983 to 2003. For one item these odds

decreased. These changes could be an indication that the construct of teacher-reported Attention Problems has changed between 1983 and 2003.

The diagnosis ADHD, the increased knowledge of its etiology and treatment, and its suggested increased prevalence has gained a lot of media exposure over recent years. Several studies have described increases in the prevalence and treatment of ADHD during the 1990 (Olfson et al., 2003; Robison et al., 2002; Toh, 2006). However, results of these studies have some methodological limitations, as they are influenced by an increased knowledge of the diagnosis and its symptoms, and by an expanded access to treatment. They therefore do not necessarily represent a true increase in prevalence. However, the increased exposure to information about this diagnosis may have influenced the way teachers judge certain behaviors that are related to attention problems. This could have influenced the way the items were related to the broader concept of attention problems in the two years under investigation. Differences concerned a greater role for disrupting and whining behavior, and a smaller role for confused behavior in 2003 than in 1983. Since two of the three DIF-displaying TRF items have no counterparts on the CBCL, we cannot conclude whether such an effect hold true for the parent reports, as parental judgment may have also been influenced by the attention paid to ADHD. Hence, results of this study indicate that although only a few items showed DIF, our previous findings regarding teacher-reported attention problems (Tick et al., in press, Chapter 2), which indicated a small increase from 1983 to 2003, need to be interpreted carefully.

When DIF is present, several issues can be at stake. First, the small changes in wording that were made for some of the items in the Dutch translation could have caused DIF. Several CBCL and TRF items have been adjusted in wording to avoid the use of old-fashioned or uncommon language. The wording has slightly changed for the DIF-displaying CBCL items: 'Can't sit still' and 'Clumsy', and for the DIF-displaying TRF item 'Whining'. These changes may have played a role in the presence of DIF. Nevertheless, the wording of several other items has also been adjusted changed and these items did not show DIF. It therefore does not seem plausible that such changes have had a large effect on the completion of the questionnaires.

Secondly, DIF could have resulted from the fact that the respondents from different time points differed in their familiarity with the behavior. This concerns the awareness that respondents have of the behavior questioned, which makes them more inclined to judge the behavior as present or absent. This could have been the case for the CBCL item 'loud'. Children in 2003 may have been less often considered loud by their parents than in 1983, as a result of an increased tolerance towards such behaviors. However, if this were the case, this would only apply to the judgment of parents, since the corresponding item on the TRF did not show such an effect.

Although the time-related causes for DIF can be expected to have an effect on the corresponding items in both questionnaires, since both parents and

teachers are subject to such changes, none of the DIF-displaying items showed DIF in both questionnaires. This indicates that systematic item bias did not play a role in the measurement. However, we cannot rule out the possibility that parents and teachers' knowledge or familiarity with the behaviors described in the items have developed differently over time.

Nonetheless, our results provided evidence that differential item functioning does not form a great threat to the comparison of the measurement of emotional and behavioral problems in samples from different time points. First, DIF was only present in 6 of the 206 items we investigated. Second, we used a very conservative criterion to judge the presence of DIF and most effects were only medium. Using a less conservative criterion, as recommended by Zumbo (1999), would have led us to conclude that none of the items displayed DIF.

This study is not without limitations. The most important limitation of this study is that the wording of several items in the ASEBA questionnaires has slightly changed and that therefore not identical items were presented in both years. This was the case because the population samples were investigated with the purpose to gain insight in the prevalence of problems, and not with the sole purpose to examine DIF. One aims at an optimal measurement of emotional and behavioral problems and it is therefore important that old-fashioned language is avoided. However, this complicates the interpretation of DIF, because the adjustment in wording might have contributed to the presence of DIF in several cases. A second limitation is that we were not able to investigate DIF in all the CBCL and TRF items, since not all items belonged to a subscale. However, most of the conclusions of studies on secular changes are based on changes in subscale scores. A final limitation is that we only investigated DIF in the ASEBA questionnaires. Although the ASEBA questionnaires are widely used to assess emotional and behavioral problems in children, this limits the generalization of these findings to other time trend studies in which other questionnaires, such as the Rutter's Scales, were used (Collishaw et al., 2004; Sourander et al., 2004).

Although we found that a few items of the ASEBA questionnaires functioned differently in samples that were assessed at different points in time, this DIF was only present when using conservative criteria to judge DIF. Hence, our research has shown that over a twenty-year period of time, the completion of questionnaires assessing behavioral and emotional problems in children has not changed much. Comparing the completion of questionnaires by samples from different points in time appears to be a valid method to investigate secular changes. Although our results showed no clear DIF in the completion of samples that were assessed 20 years apart, a DIF analysis remains a useful method to investigate the validity of studies on secular changes.

6 | Ten-Year Increase in Service Use in the Dutch Population

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Submitted for Publication

CHAPTER 6: Ten-Year Increase in Service Use in the Dutch Population

Abstract

Since earlier research has indicated an increase in mental health problems among children in the Dutch population, we investigated whether service use for mental health problems in the population has increased as well. We also investigated whether a possible increase could be explained by child, family and socio-demographic characteristics that increase the likelihood of service use and that have become more present in the Dutch population. We compared two general population samples of 6- to 18-year-olds that were assessed in 1993 and 2003. Chi-square tests were conducted to examine differences between the proportions of children who used services. We performed a logistic regression, to test whether factors promoting care use accounted for the effect of year. Service use increased from 1993 to 2003. Having serious problems, living in a family other than two biological-parents, and the presence of educational problems all increased the likelihood of service use and became more present in the Dutch population. These variables accounted for a substantial part of the increase in service use. Although the proportion of children who received help increased from 1993 to 2003, still a large number of children experience an unmet need, in spite of governmental strivings to lower the thresholds for obtaining professional help. The fact that there is an increase in the number of children experiencing risk factors that also make them more inclined to seek help, such as living in an alternative family composition or the presence of educational problems, is a worrisome development in itself.

Introduction

As a result of societal changes, the prevalence of children and adolescents' emotional and behavioral problems and their mental health service use may change over time. A few studies from different countries have investigated secular changes in children's emotional and behavioral problems, with varying findings (Achenbach et al., 2003; Collishaw et al., 2004; Sourander et al., 2004). In our previous study, we found small increases in Dutch children's emotional and behavioral problems from 1983 to 2003 (Tick et al. in press, Chapter 2). Since such problems are associated with a wide range of future adversities, such as future psychiatric problems, increased service use, teen pregnancy, criminality and truncated educational attainment (Fombonne et al., 2001a, 2001b; Hofstra et al., 2002; Kessler et al., 1995, 1997; Knapp et al., 2002; McCrone et al., 2005), it is important to tackle these problems at a young age and to provide care to those who need it. One may therefore wonder whether children's service use for mental health problems has increased in accordance with the increase in population

levels of emotional and behavioral problems. If more is known about trends in mental health service use, and about possible explanations for these trends, such information can be used for estimating service needs in the population, and, subsequently, for developing an effective health service policy.

Recent research suggests that children and adolescents make increased use of services for mental health problems. Increases were shown in the number of children treated for ADHD (Olfson et al., 2003) or visiting outpatient clinics for depression (Ma et al., 2005). An increase was also seen in psychotropic drug use among children (Olfson et al., 2006; Zito et al., 2002). The hospitalization of children for mental illness has increased as well (Kanter and Moran, 2006). These studies, however, mainly focused on the use of specific types of care, and mostly described trends in the U.S. They did not use general population data, but used admission data from specific services. Such data are influenced by registration practices that may change over time. Moreover, since admission data are provided by specific institutions, these data are not the best indicators of overall service use in the general population.

A more direct way to gain insight in overall service use for mental health problems in the general population is to compare the prevalence of service use in representative population samples from different time periods. Only few studies used this method, and their findings were inconsistent. Achenbach et al. (2003) found that the 12-month prevalence of mental health referral among American children and adolescents did not change from 1989 to 1999, whereas Sourander et al. (2004) found that service use increased among Finnish children from 1989 to 1999.

An important governmental striving throughout Europe is to provide care for those who need it, and to have an equal distribution of care in the population (Mackenbach and Stronks, 2002). Since it is known that a large number of children experiences an unmet need (Zwaanswijk et al., 2003b), ideally the gap between the number of children with problems and the children receiving help diminishes over time, and the increase in service use exceeds the increase in problems. Specific variables promoting service use may also contribute to a possible increase in service use. That is, if the societal distribution of these variables has changed over the time period under investigation. Although findings vary, studies have identified several child, family, and socio-demographic characteristics to be associated with formal care use for mental health problems. Among these are: severity of psychopathology, problem recognition, age, gender, socioeconomic status, ethnicity, family composition, physical problems, educational problems, and social competence (Zwaanswijk et al., 2003a). To our knowledge, no studies have investigated whether trends in mental health service use can be explained by changes in the societal distribution of such predictors. If more is known about such explanations, this informs us which underlying risk or promoting factors are becoming more important in service use and gives insight into whether care is equally distributed throughout the population.

Given the lack of studies on secular changes in mental health service use, the aim of our study was to examine the ten-year changes from 1993 to 2003 among children and adolescents in the Dutch population. Furthermore, we tried to identify promoting socio-demographic, child and family characteristics, and evaluated their contribution to changes in care use.

Method

Participants

1993 Sample The 1993 sample consisted of 2,719 randomly selected 4- to 18-year-olds living in the Netherlands. Data collection took place between April 1993 and June 1993. Of the 2,719 eligible parents, 2,227 provided usable data (81.9 %). For an extensive description of the sample and procedure, see Verhulst et al. (1997a). For comparison with the 2003 sample, we selected data on the 1,930 6- to 18-year-olds, for whom data on service use was available.

2003 Sample The 2003 sample consisted of 2,567 6- to 18-year-olds, randomly selected from the municipal registers of 35 municipalities in the Dutch province Zuid-Holland. Data collection took place between December 2003 and April 2005. Children with intellectual disability, major physical disability, whose parent did not speak Dutch or who departed from the study area were excluded from the sample (n=250). In total, 1,710 (73.8%) of the 2,317 eligible respondents participated. Data for 65 children was excluded since these children were 5-year-old or 19-year-old at the time of the assessment. Eventually, we selected data on the 1,632 6- to 18-year-olds for whom data on service use was available.

While the 1993 sample was a national sample, the 2003 sample was drawn only from the province of Zuid-Holland. We therefore performed χ^2 tests to examine if there were significant differences in number of deviant problems and in mental health care use between children from the 1993 sample living in Zuid-Holland and children from the 1993 sample living elsewhere in the Netherlands. There were no significant differences regarding the proportion of children with problems (χ^2=0.09, df=1, p=0.76) or the proportion of children that used mental health care (χ^2=0.77, df=1, p=0.38). We therefore decided to use the entire 1993 sample.

Measures

Mental health service use

To assess service use for mental health problems, in both surveys parents were asked whether one of the following services or professionals had been consulted for their child's mental health problems in the 12 months before the survey: primary care, community mental health care service, a psychologist, psychiatric daycare or inpatient mental health care. If their child had consulted at least one of these services or professionals for at least once in the 12 months preceding the interview, we classified the child as having used mental health care. We

dichotomized the score (0=no mental health service use, 1=mental health service use).

Socio-demographic characteristics

The samples were divided into 2 age groups: 6-11 and 12-18 years. As an indication for socioeconomic status (SES), we used parental education level and parental occupational status. In both years, parents were asked to score the highest completed level of education, varying from primary school to scientific education. Parental education was then split into two levels of education; low education (primary education or lower secondary education) and middle/high education (higher secondary occupation to scientific education). For the 1993 sample, parental occupational status was determined according to van Westerlaak's 6-step scale of occupation (Van Westerlaak et al., 1975) and subsequently divided into two SES levels (low SES; 1 and 2, middle/high SES: 3, 4, 5, and 6). For the 2003 sample we used the Standard Classification of Occupations to determine socioeconomic status, which discerns five levels of occupation (CBS, 2001). We made a comparable two-category distribution: low parental occupational status (unemployed, elementary and lower occupations), middle/high parental occupational status (secondary, higher and scientific occupations). Ethnicity was classified as Dutch or non-Dutch. Children with one or both parents born outside the Netherlands were classified as non-Dutch.

Emotional and behavioral problems

The child's emotional and behavioral problems were assessed using the Child Behavior Checklist (CBCL). The CBCL is an instrument of the Achenbach System of Empirically Based Assessment (ASEBA) and has good validity and reliability (Achenbach and Rescorla, 2001b). On the CBCL, parents are asked to rate the child's competences and problems over the preceding six months. The 120 problem items sum up to a Total Problems score, which we used to indicate problem severity. In 1993, we used the 1991 version of the CBCL, while in 2003 we used the 2001 version (Achenbach and Rescorla, 2001b). We omitted 6 problem items that differed between the two versions. We calculated cut-off scores on the CBCL Total Problems scores for both genders and two age groups (6-11 and 12-18) separately, thereby creating 4 different norm groups. In line with the classification of Achenbach and Rescorla (2001b), we set the borderline range at the 84th percentile of the norm group. Children scoring in this percentile or higher were classified as having serious problems (1=yes, no=0). To assess problem recognition, parents in both 1993 and 2003 were asked whether they regarded their child as having an emotional or behavioral problem during the last 12 months (1=yes, no=0)

Child's competence
The 20 competence items on the CBCL represent three competence scales: Activity, School and Social. These scales sum up to a Total Competence score. To indicate the child's competence, we used the Activity and Social Competence scores. We did not use the School and Total Competence scores, because too many children did not attend school. The presence of physical illness (1= yes, 0= no) was indicated by parent reports of chronic or serious illnesses. The presence of educational problems (1= yes, 0=no) was indicated by parent reports of extra help for educational problems or of special testing for educational problems.

Family characteristics
We classified children as 0= living with their two biological parents or 1= a single parent family or another family structure. Maternal psychopathology in 1993 was assessed with 29 questions on emotional and behavioral problems, derived from the Young Adult Self Report (Achenbach, 1997), an instrument developed to measure emotional and behavioral problems in adults. The YASR was revised in 2001 into the Adult Self Report; the ASR (Achenbach and Rescorla, 2003). In the 2003 sample, mothers completed the ASR. As an indicator of maternal psychopathology, we used the sum score of the 25 questions that were prominent in the 1993 and the 2003 questionnaire.

Statistical analyses
We first performed a chi-square test to examine whether the proportion of children using services changed significantly from 1993 to 2003. Secondly, to investigate which factors were significantly associated with mental health service use we performed a multivariate logistic regression on mental health service use including all predictors on the entire sample. Next, we selected the factors that were associated with mental health service use and of which the distribution differed between the samples. We performed a logistic regression on mental health service use. First we entered the variable year. Subsequently, we entered the significant factors to examine the reduction in Odds Ratio caused by addition of these factors. The reduction in OR after adding the factors was computed as follows:

$$\left(\frac{OR_{year} - OR_{year+adjustment}}{OR_{year} - 1} \right) * 100$$

If the odds ratio still differs from 1 after adjusting a factor, this indicates that still differences in mental health service use between the two years exist, that cannot be accounted for by the factors in the model.

Results

Demographics

As Table 6.1 indicates, a smaller proportion of 6-11-year olds participated in 2003 than in 1993. Chi-square analyses also indicated that in 2003, significantly more non-Dutch children participated, as well as more children from family structures other than a two-biological parent family. Moreover, in 2003 more children had educational problems, and more children had serious emotional and behavioral problems. Results from t-tests showed that in 2003, children had higher Social Competence scores, higher Maternal Psychopathology scores, and lower Activity scores than in 1993.

Trends in service use

We found that in 2003, a significantly larger proportion of children used mental health care than in 1993 (Table 6.1). This proportion increased from 3.5% to 5.9%. This increase can be regarded as small, according to effect sizes described by Cohen (1988).

Explaining trends in service use

As indicated in Table 6.2, several factors were associated with help seeking. Having serious problems increased the odds for service use, as did problem perception by parents, living in a family composition other than a 2-biological parent family, and having additional educational problems. Increased social competence decreased the odds for service use. The factors: parental education, parental occupation, ethnicity, sex, physical problems, activity, and maternal psychopathology were not associated with mental health care service use in our multivariate analysis.

As Table 6.1 indicates, four of these significant factors were differently distributed in the two years. Only the variable problem perception was equally distributed in both years. We therefore only included serious problems, educational problems, family composition, and social competence in our final model in which we tried to explain the increase in service use from 1993 to 2003.

For our final model (Table 6.3), we first included serious problems. The odds ratio of year decreased with 39% (from 1.69 to 1.42). Subsequently, we added family composition, educational problems and social competence. Table 6.3 shows the effect of adding all variables associated with service use. These variables explain 49% of the effect of year. Additional analyses show that family composition and educational problems contributed most to the reduction in Odds Ratio. Since social competence had a negative association with service use, and increased between 1993 and 2003, it did not contribute to the reduction in Odds Ratio.

Table 6.1: Demographics

Sample	1993 %	2003 %	p-value
Gender	N=1930	N=1632	
Male	50.2	48.8	.433
Female	49.8	51.2	
Age	N=1930	N=1632	
6-11 years	49.8	46.4	.046
12-18 years	50.2	53.6	
Parental Education	N=1902	N=1631	
Low	42.7	25.5	.000
Middle/ High	57.3	74.5	
Parental Occupation	N=1905	N=1632	
Low	27.9	24.1	.011
Middle/ High	72.1	75.9	
Ethnicity	N=1928	N=1632	
Dutch	95.8	79.0	.000
Non-Dutch	4.2	21.0	
Family Composition	N=1929	N=1630	
2 Biological Parents	88.0	78.3	.000
Other Family Composition	12.0	21.7	
Mental Health Service Use	N=1930	N=1632	
No	96.5	94.1	.001
Yes	3.5	5.9	
Educational Problems	N=1927	N=1624	
No	84.2	78.8	.000
Yes	15.8	21.2	
Physical Problems	N=1929	N=1628	
No	87.8	87.2	.556
Yes	12.2	12.8	
Problem Recognition	N=1930	N=1631	
No	79.8	80.4	.629
Yes	20.2	19.6	
Serious Problems	N=1930	N=1632	
No	85.5	79.5	.000
Yes	14.5	20.5	
Activity #	8.11 (N=1928)	7.52 (N=1630)	.000
Social Competence #	7.74 (N=1925)	8.03 (N=1625)	.000
Maternal Psychopathology #	5.20 (N=1850)	5.86 (N=1499)	.000

Continuous variables, mean scores are displayed.

Table 6.2 Odds ratios derived from multivariate logistic regression for child, family and socio-demographic characteristics on formal care use

	O.R.	C.I. 95%
Gender		
Male	REF	
Female	0.69	(0.48-1.01)
Age		
6-11	REF	
12-18	0.97	(0.67-1.41)
Parental Education		
Low	REF	
Middle/High	1.06	(0.66-1.70)
Parental Occupation		
Low	REF	
Middle/High	0.99	(0.60-1.62)
Ethnicity		
Dutch	REF	
Non-Dutch	0.60	(0.32-1.16)
Family Composition*		
2 Biological Parents	REF	
Other Family Composition	1.91	(1.25-2.91)
Educational Problems*		
No	REF	
Yes	2.17	(1.47-3.21)
Physical Problems		
No	REF	
Yes	1.22	(0.76-1.94)
Problem Recognition*		
No	REF	
Yes	9.37	(6.06-14.50)
Serious Problems*		
No	REF	
Yes	3.01	(1.99-4.55)
Activity #	0.98	(0.91-1.06)
Social Competence #	0.89	(0.81-0.97)
Maternal Psychopathology #	0.99	(0.97-1.03)

= continuous variable.

Table 6.3: Explaining effects of year on mental health service use

Added Variables	Odds Ratio Year	Decrease in Odds Ratio
Year (2003 vs 1993)	1.68 (1.22-2.31)	--
Year + Deviant Problems	1.42 (1.02-1.97)	39 %
Year + Deviant Problems + Family Composition + Educational Problems + Social Problems	1.35 (0.96-1.90)	49 %

Discussion

In this study we investigated the ten-year secular changes in mental health service use among 6- to 18-year old children and adolescents in the Dutch population. We found that service use increased from 3.5% in 1993 to 5.9 % in 2003, and that several child-, family-, and socio-demographic characteristics, which were more present in the Dutch population in 2003 than in 1993, accounted for a substantial part of this increase.

Secular trends in service use

In 2003, a higher percentage of children used services for mental health problems than in 1993. This increase in service use is in line with findings of other studies that focused on treatment data or admission data from hospitals (Kanter and Moran, 2006; Ma et al., 2005; Olfson et al., 2003,2005,2006; Zito et al., 2000). A Finnish population study, using a design comparable to ours, also found an increase in service use among Finnish children between 1989 and 1999 (Sourander et al., 2004). However, our findings are not in line with the results of Achenbach et al. (2003), who found no changes in the prevalence of service use in the American young population from 1989 to 1999 (Achenbach et al., 2003). The fact that Achenbach et al. (2003) found a decrease in children's mental health problems during that time period may have contributed to this inconsistency.

Explaining trends in service use

We found that the percentage of children scoring in the deviant range of the CBCL increased from 14.5% in 1993 to 20.5% in 2003. This increase was described in more detail in a previous study (Tick et al., in press, Chapter 2). We found that the increase in service use between 1993 and 2003 could for a substantial part (39%) be explained by this increase in problems. Nevertheless, we were able to identify other developments that also played a role.

When identifying child-, family- and socio-demographic characteristics that contributed to the increase in service use, we found that being from a family other than a two-biological parent family composition, parents perceiving emotional or behavioral problems in their children, and the presence of additional educational problems all increased the likelihood of using services for mental health

problems. A higher social competence was associated with lower service use. We found none of the other variables, such as SES, ethnicity, physical problems, maternal psychopathology, and variables regarding the child's competence, were associated with service use. The fact that we included an extended list of predictors in our multivariate analyses may have accounted for the absence of such associations. Additional univariate analyses showed that higher maternal psychopathology and the presence of physical problems, were both associated with service use. However, we did not find significant associations in these univariate analyses between ethnicity and service use or between SES and service use. This indicates that children from low SES families or non-Dutch children are not underrepresented in care. Associations of these socio-demographic variables with service use have been shown to be inconsistent in the literature (Zwaanswijk et al., 2003a). A previous study focusing on the Dutch population (Verhulst and van der Ende, 1997) showed no clear association between SES and service use, or ethnicity and service use either.

As our results showed, the increase in service use could for a substantial part be explained by the increase in population problem levels. Another development that played a role in the increase in service use was that there was an increase in the proportion of children living in single parent families, or in another family structure different from a two-biological parent family. This is a trend that can be seen throughout the Western world (Hess, 1995). Research has shown that such a family environment increases the risk for mental health problems (Najman et al., 1997), and that divorce or the context in which divorce takes place can be a risk factor for children's well being (Amato, 2001). These families appear to be more inclined to attend services for children's mental health problems, even when children's problem levels are taken into account. This is a common finding in literature (Sayal, 2006; Verhulst and van der Ende, 1997). An increase in the proportion of children living in such families has thus contributed to the overall increase in service use.

Another development that contributed to the increase in service use is that the proportion of children with educational problems increased from 1993 to 2003. Results showed that that these children were more likely to use mental health care, even when their emotional and behavioral problems were taken into account, which is a finding consistent with the literature (Zwaanswijk et al., 2003a).

Findings of this study indicated that social competence has increased from 1993 to 2003. Since an increased social competence decreases the odds of service use, this development has not contributed to the increase in service use we found in this study.

Because the increase in service use cannot entirely be explained by the increase in population levels of emotional and behavioral problems, this seems to indicate that the gap between the children with problems and the children receiving help is diminishing. At first sight, it appears to be a positive notion that

children from alternative family compositions or with additional educational problems make more use of mental health service. However, it is a disturbing development that the proportions of children that are experiencing additional risk factors, such as educational problems or being from a family other than a 2-biological parent family, has increased between 1993 and 2003. That these children are more inclined to use services may be caused by the fact that they function less well than others on different areas, given their educational problems, or that their families are less able to handle problems. These children may therefore have a higher need for help than children from a 2-biological parent family or children without educational problems.

Ideally, the tendency of people to seek help for children's emotional and behavioral problems would become more prevalent over time. Since we found that service use has increased more strongly than the increase in problems and the increases in the proportions of children from alternative family structures or with educational problems can account for, it appears that we are heading in the right direction. Nevertheless, given that there is a clear increase in the absolute number of children that experience serious emotional and behavioral problems, a substantial amount of children may experience an unmet need. It is therefore questionable whether we can conclude that the treatment gap is diminishing.

Limitations

The response rate of the 1993 sample (81.9%) was higher than that of 2003 sample (73.8%). This could have biased the results, since a group of children that are less prone to use services when problems are apparent may not have participated. If this is the case, service use may have increased to a lesser extent than our findings indicate. Secondly, the 1993 sample was extracted from the Netherlands, while the 2003 sample was extracted from the province of Zuid-Holland, which may have influenced our results. However, analyses did not reveal regional differences. Furthermore, the distribution of both samples differed on several characteristics. On the one hand, this reflects changes in the distribution of society, but on the other hand this could be the consequence of selective attrition. Another limitation is that we did not assess accessibility of services or other barriers or promoting factors that play a role in changes in service use in the population.

Implications

We found an increase in service use that parallels the small increase in problems that has taken place over recent years in Dutch society (Tick et al. in press, Chapter 2). We also found that in 2003, parents were more inclined to make use of mental health services than in 1993. We did not found evidence that specific socio-demographic groups, such as children from low-SES families, were underrepresented in mental health care. This equal distribution of care can be regarded as an important striving by policymakers (Mackenbach and Bakker,

2003; Mackenbach and Stronks, 2002). However, our results once again show that only a very small percentage of children with problems used services (e.g. in 2003 only 16.5 % of the children with deviant scores on the CBCL has used services). This phenomenon has often been described in the literature (Zwaanswijk et al., 2003b). It highlights an important societal problem, since mental health problems are associated with a wide range of adverse outcomes (Fombonne et al., 2001a, 2001b; Hofstra et al., 2002; Kessler et al., 1995,1997,1998; Knapp et al., 2002; McCrone et al., 2005), and it is thus important to tackle them at a young age. Because a large part of the increase in service use can be explained by an increase in problems, changing family structures, or an increase in educational problems, it appears that governmental strivings of providing care to those in need did not yet have had the large effects that are needed, especially considering that problems are shown to be increasing in the population. Much more efforts are needed to reduce the treatment gap. Future research should also address changes in other barriers to care, such as the accessibility of care or changes in attitude towards care, to provide a better evaluation of governmental strivings.

7 | General Conclusions and Discussion

GENERAL CONCLUSIONS AND DISCUSSION

In this study, the secular changes in Dutch children's emotional and behavioral problems and their service use were investigated. The results of this study showed some evidence that children's problems have increased over recent decades. However, the findings were dependent on the age group that was investigated, as well as on the informant who provided information. Changes in the way respondents are inclined to complete questionnaires did not appear to have much effect on the results. Results of this study also indicated that the prevalence of service use for mental health problems has increased among the young Dutch population. This increase could be explained for a substantial part by increases in problem levels in society and by changes in the societal distribution of certain variables associated with service use.

Secular changes in school-age children's parent- and teacher-reported problems

When looking at our findings for school age children, we identified several trends for different types of problems. With regard to changes in internalizing problems, results of this study showed a small increase in parent-reported internalizing problems from 1983 to 2003 among 6- to 16-year old children. This increase mostly concerned anxious/depressed problems and somatic problems, since these scales reached the size of a small effect according to Cohen (1988). Changes were strongest between 1993 and 2003. No secular changes were seen in teacher-reports of internalizing problems.

Although a lot of attention has been paid to trends in internalizing problems in the literature, results appear to be largely dependent on the method that was used (Maughan et al., 2005). It has often been suggested that the prevalence of depression is increasing (Fombonne, 1995). However, the literature on which this conclusion is based mostly concerns studies that have been conducted among adult populations and are hampered by methodological problems (Fombonne, 1995; Maughan et al., 2005). Costello et al. (2006), who performed a meta-analysis on 26 epidemiological studies, did not find evidence for an increase in child and adolescent depressive disorders over the past thirty years. This does not confirm the small increases in internalizing problems found in this study. However, since we determined population levels of emotional problems and did not investigate the prevalence of psychiatric diagnoses of depression, we cannot specifically draw conclusions regarding changes in the prevalence of depressive diagnoses. Nonetheless, we did find a significant increase from 16.5 % in 1983 to 26.8% in 2003 in children with serious levels of parent-reported internalizing problems.

Studies that investigated secular changes in parent- and teacher-reported emotional problems by using a method comparable to ours showed mixed findings. Table 7.1 gives an overview of the studies that have compared samples from different time points that were assessed with identical measures.

Table 7.1 Overview Population Studies

Study	Time Period	Country	Samples	Age	Informant	Instruments	Findings
Achenbach et al. (2002a,2002b,2003)	1976-1989-1999	U.S.	Random samples	6-16	Parents Teachers Self	CBCL, TRF, YSR	-Increase in parent- and teacher reported externalizing, internalizing and attention problems 1976-1989 -Decrease in these problems 1989-1999 -Decrease self-reported anxiety and oppositional defiant problems 1989-1999
Collishaw et al. (2004)	1974-1989-1999	U.K.	Random samples	15-16	Parents	SDQ, Rutter scales	-Strong increase conduct problems -Increase emotional problems -No change hyperactive problems
Sourander et al. (2004)	1989-1999	Finland	Random samples	8-9	Parents Teachers Self	Rutter Scales	-Decrease parent reported conduct and emotional problems among boys -Decrease teacher-reported conduct, emotional, and hyperactive problems -Increase parent-reported hyperactive problems among girls -Increase self-reported depressive problems

Fichter et al. (2004)	1980-1998	Greece	School based samples	13-19	Self	GHQ	-Increase psychological distress
Wangby et al. (2005)	1970-1996	Sweden	School based samples	15	Self	Symptoms Questionnaire	-Increase self-esteem problems -Increase antisocial problems
West and Sweeting et al. (2003)	1987-1999	Scotland	One random and one school based sample	15	Self	GHQ	-Increase psychological distress among girls
Tick et al. (in press)	1989-2003	The Netherlands	Random samples	2-3	Parent	CBCL/1½-5	-Decrease internalizing problems -Decrease attention problems
Tick et al. (in press) and Verhulst et al. (1997)	1983-1993-2003	The Netherlands	Random samples	6-18	Parent Teacher Self	CBCL TRF YSR	-Increase parent-reported internalizing problems -Increase deviant parent- and teacher-reported rule breaking behavior -Decrease (boys) self-reported externalizing problems - Increase teacher-reported attention problems -Decrease parent-reported attention problems -Increase self-reported and parent-reported thought problems

While among British adolescents an increase in emotional problems was identified (Collishaw et al., 2004), a small decrease in such problems was found among Finnish children (Sourander et al., 2004). American children's parent- and teacher-reported emotional problems increased from 1976 to 1999, but showed a slight decrease from 1989 to 1999 (Achenbach et al., 2002a, 2002b, 2003). Nevertheless, most trends identified in these studies were small.

With regard to externalizing problems, we found no clear secular changes in the mean levels of parent-reported and teacher-reported problems, only a small increase in the proportion of children with serious parent- or teacher-reported rule-breaking behavior scores. These small increases in externalizing problems do not coincide with the large increase in conduct problems that was seen among British adolescents (Collishaw et al., 2004), or with the small decreases that were seen among Finnish (Sourander et al., 2004) and American children (Achenbach et al., 2002a, 2003). Hence, as was the case for internalizing problems, findings regarding externalizing problems from different studies are inconsistent.

With regard to attention problems, this study showed a small increase in teacher-reported attention problems from 1983 to 2003, which was contradicted by results of the parent reports. Findings from previous studies on trends in attention problems are largely dependent on the type of data that were used. Several studies have suggested an increase in diagnoses ADHD (Olfson et al., 2003; Robison et al., 2002; Toh, 2006). These studies mostly used registration data on patients with ADHD. The problem with these data is that they are influenced by better knowledge of the diagnosis ADHD and by an expanded access to treatment over time (Maughan et al., 2005). They therefore do not necessarily indicate a true increase in attention problems. The suggested increases in ADHD were not confirmed by findings from population studies using rating scale scores (Table 7.1), which have shown only small or absent trends. A small increase in parent- reported hyperactive problems was seen among Finnish girls (Sourander et al., 2004), whereas Collishaw et al (2004) found no changes among British adolescents, and Achenbach et al. (2003, 2002b) found an initial increase to be followed by a small decrease.

In this study, we also found a small increase in parent-reported thought problems from 1983 to 2003, that was not confirmed by findings of the American study (Achenbach et al., 2003). This scale contains items such as 'can't gets mind of thoughts', 'repeats acts', 'strange behavior' and 'sees things that are not there'. No other studies have investigated changes in the prevalence of thought problems. The CBCL thought problems scale measures symptoms associated with psychotic problems and Early Onset Schizophrenia, although findings vary with regard to the presence of such an association (Miller et al., 2002; Muratori et al., 2005). Some studies have linked the thought problems syndrome scale to autism (Bolte et al., 1999; Duarte et al., 2003) or Obsessive Compulsive Disorder (Cardona et al., 2004). Although the literature describes evidence that prevalence rates of autism are increasing (Croen et al., 2002; Gillberg and Wing, 1999;

Gurney et al., 2003), which would be in line with our findings on thought problems, these studies are hampered by too many methodological difficulties to assume that the incidence of autism is increasing (Fombonne, 2001, 2003). The increase in thought problems could be explained by a possible change over time in parent's attitude towards behavior that is questioned by certain items such as: 'sees things that are not there', or 'strange behavior'. Such items are open-ended, since parents are asked to describe the behavior. Rater bias may also have played a role in the judgment of such open-ended items in this scale. However, if changes in response tendency or rater bias influenced the completion of specific open-ended items, we would have been able to identify such items in our differential item functioning analyses. This was not the case; our analyses showed no evidence that certain open-ended items functioned differently in different years.

Besides the increases we found for several types of problems, a few other other results of this study also give the impression that children's functioning has worsened over recent decades. Not only did we find an increase of children with serious internalizing problems, i.e. scoring in the deviant range of the internalizing scale, we also found that the percentage of children who experience both serious internalizing and serious externalizing problems has increased from 1993 to 2003. Also, the increases in problems that we identified in this study were accompanied by a decrease on several areas of parent- and teacher-reported competencies, which mostly took place between 1993 and 2003.

Hence, we found evidence for some increases from 1983 to 2003 in parent- and teacher-reported emotional and behavioral problems among school-age children, which were clearest in parent reports and mostly concerned internalizing problems. Teacher reports showed only minor changes. When comparing these findings to studies from other countries, results are not consistent, indicating cross-cultural variation, which will be discussed in a subsequent paragraph.

Secular changes in adolescents' self-reported problems

Results of this study did not confirm the increase in adolescents' self-reported emotional problems found in other studies (Achenbach et al., 2002b; Fichter et al., 2004; West and Sweeting, 2003). However, we did find an increase in self-harm and suicidal ideation, which is a trend that has been described previously in the literature (Fortune and Hawton, 2005) The decreasing trend in externalizing problems that was found in this study is in line with the decrease in self-reported oppositional defiant problems that was found by Achenbach et al. (2002b), but not with the increase in antisocial problems found by Wangby et al. (2005). Although we found overall externalizing problems to have decreased, we did find clear increases in self-reported substance use. Such trends in substance use have been described previously in the literature (Trimbos, 2006). We also identified an increase in thought problems that was apparent in the parent-reports as well. As

we discussed in the previous paragraph, there is not much information available on secular changes regarding such problems to compare our findings with.

Results of this study showed some gender differences, indicating that for several scales decreases were seen only among boys, whereas drunkenness showed a stronger increasing trend among girls that among boys. Gender differences in self-reported problems were also seen in the study by West and Sweeting (2003). However, they found an increase in internalizing problems among girls, whereas we found decreases in social and externalizing problems among boys. The finding that girls appear to have caught up with boys with regard to their excessive alcohol use, has also been established in previous studies (McPherson et al., 2004; Plant, 2001; Poelen et al., 2005; Trimbos, 2007). Besides these gender differences, trends in self-reported functioning did not differ much for various socio-demographic groups, although we found some indications that younger adolescents have become somewhat more at risk for somatic problems.

Hence, self-reports showed a few small trends in self-reported overall emotional and behavioral problems among Dutch adolescents from 1993 to 2003, which appear to have affected girls' well-being most negatively. That is, suicidal ideation and self-harming behaviors, which this study showed to have increased, are most prevalent among girls. Also, girls appear to be catching up with boys with regard to substance use, and they did not experience the decreasing trends in problems that were seen among boys.

Secular changes in very young children's parent-reported problems

Among 2- and 3-year-olds, we found evidence for small decreases in parent-reported internalizing problems and attention problems from 1989 to 2003, as well as associated decreases in the proportions of children scoring in the deviant range of these scales. The knowledge of emotional and behavioral problems in very young children is limited (Egger and Angold, 2006), not in the least because instruments to assess problems at such a young age are still under development (Carter et al., 2004). Although it becomes increasingly clear that psychiatric problems already exist at a very young age, the knowledge of the epidemiology of psychopathology among these young children is limited (Egger and Angold, 2006). Since our study was the first to investigate secular changes in the preschool-age, there is a lack of data to compare our findings with. An increase in the use of psychotropic medication among preschoolers has been described in a previous study (Zito et al., 2000). Although this may raise concern about young children's well-being in the population, such an increase in medication use is largely influenced by changes in attitude toward medication use, as well as by an increasing knowledge of the effectiveness of medication. Such a trend therefore does not necessarily indicate that population levels of problems are increasing.

Hence, our findings did not show any evidence that preschoolers' emotional and behavioral problems have increased from 1989-2003. A few very

small decreases in problems were seen, which contradict our findings regarding school-age children and adolescents.

Explaining differences between age groups

Among very young children, some decreases in parent-reported emotional problems were seen, whereas among school-age children, these problems increased. The lack of significant interaction effects of year by age in the analyses on the school-age sample indicates that the trends did not differ between younger versus older school-age children. The different trends thus appear to concern only the preschool children versus the 6- to 16-year-olds.

Explaining these differences between age groups is a difficult task. The difference may be based on methodological issues, or may be due to the fact that preschool children are actually subject to different secular changes than school-age children. If this age group difference is of a methodological nature, the explanation needs to be sought in the samples or instruments used. The 1989 preschool sample was selected with a somewhat different selection method than the other samples (Koot and Verhulst, 1991), which may have influenced the results. However, most samples that were used to investigate parent-reported changes (all but the 1993 sample) were randomly selected from the same region; the province of Zuid-Holland. In our analyses, we adjusted for differences between samples with regard to the SES and ethnicity distributions, and rerun our analyses without such adjustments. All analyses revealed similar results. We therefore do not expect differences between samples to have influenced our findings. With regard to the instruments, the school-age and the preschool-age children all were assessed with well developed, comparable diagnostic checklists: the CBCL/6-18 and the CBCL/1½ -5 (Achenbach and Rescorla, 2001a; 2001b). It is therefore also not plausible that the use of different instruments for different age groups has caused this age group difference.

Perhaps the secular changes were truly different for preschool-age and school-age children. Developments that influence secular increases may have affected school-age children, but not children in the preschool years. Developments that can be thought to affect the environment of children, and may therefore underlie secular changes in problems, are depicted in Table 7.2. It can be argued that very young children are less directly confronted with societal changes outside the family. They do not have the cognitive capacity to process information on all outside stressors, and the family context is central to them. They are therefore less influenced by societal developments such as those regarding the school system, interethnic tension, and changes in the leisure activities of families, such as increased computer use, and developing media.

According to our data, the increase in the proportion of children living in alternative family structures was much higher in the school-age group (12.0% in 1993 vs. 21.9% in 2003) than in the preschool-age group (4.7% in 1989 vs. 5.7% in 2003). It thus appears that the preschool children were less often confronted

with changes in family structures, such as divorce. This difference can be explained by the fact that parents of 6- to 18-year-olds are, on average, together for a longer period of timer than parents of 2- to 3-year olds, given the age of their children. They therefore had more time to experience marital problems resulting in a change in family structure. Given that divorce is associated with problems, as is being from a family other than an intact family (Amato, 2001; Garnefski and Diekstra, 1997), these different trends regarding family composition may have contributed to the difference between secular changes among school-age and preschool-age children. Nevertheless, the fact that we found different trends for both age groups remains somewhat remarkable, since one could expect societal developments that are thought to underlie secular changes to have an effect on both age groups, either directly or indirectly via changes in the well-being of their parents.

Inter-informant differences

As is once again confirmed by the findings of this study, inter-informant differences are a common phenomenon in research on emotional and behavioral problems of children (De Los Reyes and Kazdin, 2005; Ferdinand et al., 2004). Such informant differences were seen in other secular trend studies as well (Sourander et al., 2004). Inter-informant differences pose interpretative challenges, since no informant can be qualified as the gold standard (van der Ende, 1999). We found that for school-age children, changes were clearer in parent reports than in teacher reports. For adolescents, the self-reports did not show the increases seen in the parent reports.

Differences between informants may result from the fact that some informants judge certain problems in children differently than others. Teachers might have another perspective on the children's emotional functioning than parents, which could explain the lack of trends regarding emotional problems in teacher reports. However, self-reports did not confirm these increases either, even though the adolescent him/herself can be regarded as an important judge of internalizing problems in adolescence. Since teachers observe students in a social and task-oriented context, the increase in teacher-reported attention problems can be regarded as an important finding, regardless of the fact that this finding was contradicted by the parent-report findings.

Inter-informant differences in the identified secular changes may also result from the fact that different informants use different frames of references. For example, teachers judge children in a classroom context. If the entire classroom has become more problematic, as a result of an increase in problems throughout the population, a teacher may be less likely to judge a child as deviant. Parents on the other hand may judge their children in a broader context, taking their previous experiences with children and the child's past behavior into account, and use a less 'horizontal' frame of reference than teachers. Our data show that age effects, indicating different scores for different age groups, were indeed

apparent on more scales and were stronger in the CBCL reports than in the TRF and YSR reports. This is in line with the hypothesis that different frames of reference may have influenced the differences between reports of different informants.

Inter-informant differences may also result from the fact that there is a true difference between trends in the school environment versus the home environment. As the school situation and the family situation develop over time, some problems might become more apparent or prevalent in certain situations. This may cause parents, teachers, or adolescents to judge children and adolescents differently, and lead to inter-informant differences in the secular trends that are identified. Nevertheless, whatever explanations may underlie the inter-informant differences in secular trends, when looking at the overall picture there are some indications that school-age children and adolescents' problems have increased over recent decades.

The role of reporter bias

When comparing samples from different time points, changes across time in response tendencies of respondents may influence the findings. Such changing response tendencies can result from changes in the knowledge or familiarity with the behaviors questioned. An issue of measurement is at stake here, since respondents may be more likely to endorse an item in a certain time period, not because the behavior is more prevalent during that time period, but because the respondent is more familiar with the behavior questioned. This study has tried to shed some light on this topic by investigating whether items functioned differently in relation to the underlying problems they intend to measure for the different samples, i.e. whether items showed Differential Item Functioning (DIF). We found that only six of the 206 items we investigated displayed DIF, and that the effects were small.

When the DIF-displaying items were removed from the analyses, however, the effect sizes of the effects of year on the scales including these items diminished slightly, but remained significant. When the presence of DIF is identified, this does not necessarily mean that the item should be excluded from the assessment. DIF does not always indicate measurement problems. The relation of the item with the underlying problem trait that it intends to measure could have truly changed, perhaps as a result of some environmental change. Hence, since we found that only a sparse number of items displayed DIF, which was only present when a very conservative criterion to judge DIF was used, we can conclude that we do not have to worry much about the influence of changing response tendencies in this study. These results suggest that response tendencies have not changed much over the time period under investigation.

Changes in the prevalence of service use

We found an increase from 3.5% in 1993 to 5.9% in 2003 in the proportion of 6- to 16-year old children who used services for mental health problems in the previous year. Such an increase is in line with findings regarding trends in more specialized services in the US and in the Netherlands (Kanter and Moran, 2006; Ma et al., 2005; Olfson et al., 2006; Sytema et al., 2006). Findings from other population studies that compared general service use in population samples from different time points are mixed (Achenbach et al., 2003; Sourander et al., 2004).

Since this study showed an increase in parent-reported mental health problems among Dutch children, and since parents play an important role in the help-seeking process, it comes as no surprise that use of services for mental health problems has increased over time. We indeed found that this increase could be explained to a large extent by the secular increase in emotional and behavioral problems among these children. We were able to identify other developments that also influenced the secular increase in service use. As compared to the 1993 sample, more children in the 2003 sample were living in families other than a two-biological parent family or had educational problems in the previous year. According to our findings, these children were more likely to have used services. Perhaps the associated problems that they have in their home or school situation worsen their burden. The families with a structure other than a two-biological-parent family may be less resilient, which may lead to a higher need for care than children with comparable problem levels living in two-biological parent families. Perhaps the psychosocial problems of children with educational problems are identified in an earlier stage, as a result of being better monitored than other children in the school situation.

Hence, our findings indicate that service use for children's mental health problems has increased from 1993 to 2003. It increased more strongly than the increase in problems and the increases in the proportions of children from alternative family structures or children with educational problems can account for. It thus appears that we are heading in the right direction. Nevertheless, given that there is a clear increase in the absolute number of children that experience serious emotional and behavioral problems, a substantial amount of children experiences an unmet need. It is therefore questionable whether we can conclude that the treatment gap is diminishing.

Cross-cultural differences

When our findings are compared with those of population studies that have been conducted in other countries, differences appear. Some differences may result from the use of different instruments, the different time periods under investigation, or because of the differences between the samples regarding the sampling method or the age range under investigation. Nonetheless, although these methodological differences may have some influence, it is important to question whether results of time trend studies can be generalized, given the cross-

cultural variation in findings (Table 7.1). Differences may appear because within a ten- or twenty-year period of time, secular changes are influenced by direct economical or political decisions, resulting in societal changes that are specific to the society under investigation. Over a more extended period of time, the overall trends in different Western countries may become more alike, as many developments that change the environment of children are taking place gradually throughout the Western world (Table 7.2). Hence, the populations of different countries need to be monitored continuously to gain insight in the trends that are taking place throughout the world and in the effects that different developments have on the functioning of youngsters.

Table 7.2: Influences changing the environment of children and adolescents

Positive Influences
-Economic growth and decreasing poverty (CBS, 2007; Vrooman et al., 2005) create opportunities for children
-The mental health care system develops, and prevention and intervention projects are being conducted (www.nji.nl)
-Increased knowledge becomes available on children's mental health (Costello et al., 2005; Costello et al., 2006b)
Negative Influences
- More children live in single parent families and stepparent families (CBS, 2007; Hess, 1995)
- The ethnic distribution of society changes (CBS, 2007), resulting in interethnic tension (Gijsberts, 2004), and an increased proportion of children who are more at risk for problems (Bengi Arslan et al., 1997; Janssen et al., 2004; Stevens et al., 2003)
- An increased number of children have parents who both have full time or nearly full time jobs (CBS, 2007)
- An increased number of children spend many hours in child care (CBS, 2007)
- Children increasingly use the computer (Hughes Jr and Hans, 2001; Zeijl et al., 2002)
- Developing media cause children to be more confronted more with political tension and developments, and to be more at risk for the anxiety induced by witnessing negative events (Silver et al., 2002)
- Society, and parents, put increased demands on children (Rutter and Smith, 1995)

Towards explaining secular changes

If children's problems have increased over recent decades, it is difficult to explain what may have caused such changes. Children are subject to an interaction of several negative and positive developments that take place in society at a more distal or proximal level. Unfortunately, we did not collect data on these possible influences. This limits us from analyzing the causes of the small trends we found. It is important to also collect data on influences thought to underlie secular changes (as displayed in Table 7.2). The effects of such influences on secular

changes can then be examined. This for example regards data on day care use, leisure activities of the family, the family situation, experiences in the school setting such as feeling the pressure to perform, and data on exposure to global problems and political developments through media. More research needs to be done to gain a clear picture to what extent such influences are associated with the development of psychopathology in children, since for some of these variables, no clear conclusions can yet be drawn regarding their effects on children.

Other authors have carefully speculated about which changes may underlie increases in emotional and behavioral problems. Collishaw et al. (2004) mention that changes in the family context may underlie increases in emotional and behavioral problems. However, since secular changes are taking place on an overall population level, they acknowledge that the influence of the changes in family structures is limited. Rutter & Smith (1995) pose that the development of a greater adolescent time period, a greater freedom and a greater emphasis on educational attainment may lie at the basis of secular changes. Sourander et al. (2004) pose that increased demands in both societies and within families may play a part in the increase of emotional problems. However, these proposed influences need to be investigated in empirical studies to evaluate their role in secular changes.

Hence, unravelling the mechanisms underlying secular change is very complex. After trends have been identified and secular changes are described, a subsequent step is to investigate to what extent these changes can be explained by societal influences. As Maughan et al. (2005) state, it is important that we learn more about changing social conditions that can contribute to influence the next generation of children and young people's mental health.

Interpretation of the findings from this study

Interpreting the findings of this study, and determining their clinical significance and societal consequences, is a complex task. Since working with such large samples increases the odds to find significant effects, we chose also to report the effect sizes, to gain more insight in the most important effects. All significant effects we found in this study can be judged as small, at least according to their effect size (Cohen, 1988).

These small increases on the one hand tone down broad statements referring to today's children's behavior becoming increasingly problematic. They counterbalance the strong increases in the prevalence of psychiatric diagnoses that are sometimes suggested in the literature (Fombonne, 1998a; Maughan et al., 2005; Rutter, 2005; Rutter and Smith, 1995). Studies on which such statements are based have already been criticized for being subject to several methodological problems such as being influenced by changes in the diagnostics, changes in the knowledge of diagnostic symptoms, or working only with lifetime prevalence rates. Trends found in other studies that used identical measurements on samples from different time points were mostly small (Table 7.1).

From a societal perspective, on the other hand, the small magnitude of the effects found in our study and other studies need to be judged carefully. Increases may have larger consequences than one would suspect given their small effect size. Considering the subject under investigation, one may wonder whether any effect sizes exceeding the small range could have been expected. These small effects may already have serious consequences for society. If the proportion of children with serious problem scores increases with several percent, this means that there is a substantial increase in the absolute number of children who may need mental health care. Such serious child mental health problems are associated with a wide range of future adversities, such as future psychiatric problems, increased service use, teen pregnancy, criminality, and truncated educational attainment (Fombonne et al., 2001a, 2001b; Hofstra et al., 2002; Kessler et al., 1995,1997; Knapp et al., 2002; McCrone et al., 2005). These at risk children will grow up, and bear children themselves, who are at increased risk for psychopathology given their parental problems (Connell and Goodman, 2002). The absolute effects that such small secular changes have on society may therefore be greater than the small effect sizes suggest.

Another comment needs to be made with regard to the interpretation of our findings. In our analyses we have included ethnicity as a covariate. We thus have created a somewhat artificial distribution of the Dutch society, which does not incorporate the changes in ethnic distribution that have taken place in Dutch society over recent decades. As a result of immigration, the number of people from a non-Dutch ethnic background living in the Netherlands has increased from 475,873 in 1980 to 1,622,602 in 2003 (CBS, 2006). Because we have controlled for ethnicity, results of this study answer the question whether problem levels in society have increased among children and adolescents, regardless of the fact that society itself has changed. However, non-Dutch children appear to be at higher risk for problems, as the significant effects of ethnicity in our study indicate, as well as findings from previous studies among Dutch minorities (Bengi Arslan et al., 1997; Janssen et al., 2004; Stevens et al., 2003). If we had been able to also assess the excluded children whose parents did not speak Dutch, and if we had not used ethnicity as a covariate in our analyses, the increasing trends we found would probably have been stronger. We also performed our analyses without taking into account the effects of ethnicity, and found that this only minimally changed the results. Some changes on the externalizing scales in the CBCL now had a small effect.

Hence, although the trends found in this study were small, they may have substantial effects on society and need therefore be taken seriously, especially since the magnitude of the trends we found is influenced by the fact that we excluded children from non-Dutch speaking parents.

Strengths & Limitations

One of the strengths of this study is that data were obtained from several large samples representative for the Dutch population. Identical measures were used to assess emotional and behavioral problems, which enabled comparability between assessments from different samples. These instruments are proven to be reliable and valid instruments to investigate children and adolescent's psychopathology (Achenbach and Rescorla, 2001a; 2001b). By using these instruments, information was collected on a wide array of emotional and behavioral problems. This gave us insight into secular changes regarding the entire spectrum of problems, rather than one specific area. Another strength of this study is that, compared to other studies on secular changes, twenty years is a relatively long time period of time to have studied secular changes using this method. Also, data were obtained from multiple informants, which continuously has been shown to be important when investigating child and adolescent psychopathology (Achenbach and Rescorla, 2001b; van der Ende, 1999).

Of course this study is not without limitations either. These limitations were described extensively in the previous chapters of this thesis. The most important limitation is that the samples differed on several aspects. The response rates of the various samples differed, with lowest response rates in 2003. This may have affected the results. Also, the low SES group appeared to be underrepresented in the 2003 sample. Moreover, we had to exclude in total 7.6% of the children selected for the 2003 sample, because their parents did not speak Dutch. Our findings can therefore only be generalized to the Dutch speaking part of the population. Since effects of ethnicity indicated non-Dutch children to have higher problem scores in this study, we may have excluded children with even higher problem levels.

Another limitation is that the 1993 sample was extracted from the Netherlands, while the other samples were extracted from the province of Zuid-Holland. This may have affected our results. Furthermore, one may wonder whether Zuid-Holland, as the most industrialized part of the Netherlands, is representative for the entire Dutch population. However, analyses on the 1993 sample revealed no differences between Zuid-Holland and the rest of the Netherlands, with regard to the children's problem scores. Nevertheless, we were not able to investigate whether such differences were apparent or not in the years in which the other samples were assessed.

Another limitation is that the questionnaires that were used in the different samples were not completely identical. In line with the revision of the ASEBA questionnaires in 2001 (Achenbach and Rescorla, 2001a; 2001b), some changes in wording of the items in the Dutch translation were made. However, our differential item functioning analyses did not suggest that these slight changes have had a clear effect on the completion of the rating scales by the informants.

Clinical implications & Future research

In this study, evidence was found for slight increases in Dutch children and adolescents' emotional and behavioral problems that have taken place over recent decades. Although the increases we identified were small, they may have serious societal consequences. The mental health care system needs to be equipped and prepared for an increase in service use, and target the increasing number of children that may experience an unmet need.

Only a very small percentage of children with serious problems actually reach the mental health care system (Zwaanswijk et al., 2003b), as is once again confirmed by findings of this study. Efforts should be made to diminish the treatment gap, and to provide care to those who need it. This, of course, already is an important striving of our society as well as of many other Western countries (Mackenbach and Bakker, 2003; Mackenbach and Stronks, 2002). Nevertheless, the large increase in the absolute number of children who experience serious problems according to their parents, and that are at risk for adverse future consequences, emphasize its importance.

Results of this study have shown that different types of problems have increased. This highlights the need for specific interventions. This study indicates that especially parent-reported internalizing problems have increased among school-age children from 1983 to 2003. Intervention strategies targeting these kinds of problems need extra attention. Several interventions that focus on emotional problems, such as the 'Friends' program (Barrett et al., 2006), are already being conducted in the Netherlands, and ongoing studies examine the effectiveness of such programs in the Dutch population (www.nji.nl). Such studies are important, given that results of the present study suggest that internalizing problems and associated self-harming behaviors have become more prevalent in the Dutch population. According to our results regarding teacher-reported problems, attention problems have become more prevalent in the classroom environment. This highlights the need for school-based interventions targeting these problems in the classroom. We also found large increases in self-reported substance use from 1993 to 2003. Dutch institutions such as the Trimbos institute already conduct preventive projects on substance abuse (Trimbos, 2007). Findings of this study once again confirm the necessity of these efforts. Importantly, adolescent girls need an extra focus, since the increasing trend in excessive alcohol use was strongest among girls.

Results of this study showed that secular increases in problems mostly concern school-age children and not so much preschool-age children. The school-age therefore appears to be a vulnerable age in which children may experience the greatest effects of societal developments. However, although school-age children appear to be an important target for interventions, preventive efforts should be made to prepare at risk children for the transition to school and to prevent the development of problems. Several such efforts are already being conducted,

although data regarding the effectiveness of such interventions is often limited (www.nji.nl).

This study has not incorporated all changes in ethnic distributions that have taken place in the Dutch society, because we excluded the children whose parents did not speak Dutch. The trends found in this study might therefore be smaller than those that have actually taken place in Dutch society. In future assessments it is important that children from a non-Dutch ethnic background, whose parents may not speak Dutch sufficiently, are included in these research projects as well, since they constitute a significant part of Dutch society. Perhaps well-validated translations of measures should be used. However, including these children raises some methodological issues. Firstly, a cultural bias may influence the completion of instruments, which complicates the comparison of findings in this group to the Dutch population. Secondly, cultural-specific factors may influence the development of problems, and therefore the trends experienced may be different for different ethnic groups. These issues need to be carefully examined when studies on time trends incorporate both Dutch and non-Dutch subjects.

Since trends may become clearer over a longer period of time, the Dutch population and other populations need to be monitored continuously to gain insight in the development of these secular changes. This provides important information for estimating service needs in the population, and to gain more insight in the risk groups in society. When monitoring trends in different countries, studies should focus on large samples that are representative for the population. A wide range of problems should be assessed, using identical instruments at different time points, while obtaining information from multiple informants. It is important to monitor changes cross-culturally, to distinguish the trends that are taking place throughout the world, and the trends that are specific to certain societies. Future time trend studies need to be conducted in more developing countries as well, since trends in such countries may offer some additional information on the effects that societal developments have on the well-being of children and adolescents.

Although we have investigated changes in the percentages of children with high problem scores, rating scale scores do not equate psychiatric diagnoses. Future research should also focus on secular changes in the prevalence of psychiatric diagnoses, to gain a more specific insight in the changing prevalence of children that are in serious need for help and may need specific treatment for their diagnosis. It is important that such studies on changes in the prevalence of diagnoses use identical diagnostic procedures on samples from different time points.

As was mentioned by Fergusson (1996), as a consequence of the increased social diversity that has taken place in society, the variation in children's functioning might be changing as well. Research to date has focused mostly on the secular changes in children's problem levels, or in changes in the percentages

of children experiencing serious problems. It could be, however, that as a result of increased social diversity, the proportion of children who are very well adjusted is increasing as well. We were not able to determine such a development in our study on school age children, in which we assessed both problems and competences. Nevertheless, to gain a complete picture of secular developments, it is important to focus on possible changes in the entire spectrum of adjustment, and to investigate changes in competences as well as changes in problems.

Identifying time trends in children's emotional and behavioral problems is only the first step towards unraveling the mechanisms that lay at the base of secular changes. Yet, it is very difficult to disentangle such mechanisms. Ideally, population samples from different time periods, consisting of multiple birth cohorts, are followed longitudinally, to gain more insight in cause and effect relations of changing societal conditions and their consequences. Future studies should take into account extensive information on environmental processes that may have played a role in secular developments, since it is very important that we learn more about the societal conditions that influence children's mental health.

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Summary

SUMMARY

Times are changing, and so is the environment of children and adolescents. It is often suggested that this changing environment has adverse consequences for children's well-being. The objective of the present study was to investigate whether Dutch children's emotional and behavioral problems have increased over recent decades.

In *Chapter 1*, a general introduction to this study is given. It presents the background to which this study has been conducted. Several changes in the close and in the more distant environment of children and adolescents have taken place over recent decades, which may have influenced their well-being. There are several methods that have been used to study time trends in children's mental health. Although several studies have suggested secular increases in children's emotional and behavioral problems, most of these findings are based on studies that have compared diagnostic data from different time periods, lifetime prevalences of different birth cohorts, or have used treatment data or patient registration data. Such information is influenced by changing diagnostic criteria over time, enhanced knowledge of the diagnosis and its symptoms, recall bias, changing registration methods or by changing access to care. A more direct way to investigate secular changes, less hampered by such methodological problems, is to compare population samples from different time periods that were assessed with identical measures. Only few such studies have been conducted. Most of these studies, however, have been limited by investigating only a narrow age range, obtaining data from only one informant, investigating a short time period or using school based samples. In this study, we have investigated secular changes in a wide range of emotional and behavioral problems. We have compares population samples of children in a broad age range from different time periods, and obtained data from multiple informants. Data on service use was also collected. More specifically, this study had the following research questions: 1) To what extent are there fourteen-, twenty- and ten-year secular changes in parent-, teacher- and self-reported emotional and behavioral problems of Dutch very young children, school-age children and adolescents? 2) To what extent have changes in peoples' response tendencies influenced reports of emotional and behavioral problems from samples assessed at different points in time in time? 3) Did the prevalence of children's service use for mental health problems change across time in the Dutch general population?

In *Chapter 2*, we investigated the twenty-year secular changes in teacher- and parent-reported emotional and behavioral problems among school-age children. We have compared CBCL and TRF problem and competence scores of three independent population samples, one assessed in 1983, one in 1993 and one in 2003. Mean scores increased on several CBCL syndrome scales, mostly between 1993 and 2003. Only a few increases reached the size of a small effect. These were on the Anxious/Depressed, Somatic Problems and Internalizing

scales. Teacher reports showed only a small increase in Attention Problems that did not reach the size of a small effect. On several CBCL and TRF scales, increases from 1983 to 2003 were seen with regard to the percentages of deviant scoring children. Results of an analysis in which we took both parent and teacher reports into account, showed that not only the proportion of children who scored deviant on the Internalizing scale increased, but also the proportion of children with both deviant Internalizing and Externalizing scores, according to parents or teachers. Results regarding the competence scores showed decreases in parent-reported total competence and in teacher-reported adaptive functioning between 1993 and 2003.

In *Chapter 3*, we investigated the secular changes in parent-reported problems of Dutch 2- and 3-year-old children. We compared mean CBCL scores and percentages of deviant scoring children across two samples, one assessed in 1989 and one assessed in 2003. Results revealed decreases in mean parent-reported Internalizing and Attention problems scores. The proportions of deviant scoring children on these scales also decreased. These results indicated that very young children's emotional and behavioral problems have not increased from 1989 to 2003, findings even showed some small improvements in children's functioning.

In *Chapter 4*, we investigated the ten-year secular changes in self-reported emotional and behavioral problems of Dutch 11- to 18-year old adolescents. We compared YSR scores and self-reports of police contact, self-harm, suicidal ideation and substance use across two adolescent population samples, one assessed in 1993 and one assessed in 2003. We also investigated whether trends were different for various socio-demographic groups. Small decreases were seen on YSR Externalizing problems, whereas YSR Thought Problems scores and reports of suicidal ideation, self-harm, drunkenness and drug use increased. Socio-demographic differences in trends concerned mostly different trends for boys and girls. Boys' Total Problems, Rule-Breaking Behavior and Social Problems scores decreased, whereas girls' scores remained stable. We found an increase in drunkenness that was stronger for girls than for boys. Since girls mostly exhibit self-harming behaviors and suicidal ideation, which became more prevalent, it appears that the negative effects of the small increasing trends mostly affected girls' functioning.

In *Chapter 5*, we investigated whether response tendencies of the respondents changed from 1983 to 2003. Such changes could have been the result of changes in the wording of items or of an increased knowledge of the behaviors questioned. We compared the CBCL and TRF completions of the two population samples from 1983 and 2003. We conducted differential item functioning (DIF) analyses to examine whether the relations between the problem items and the underlying problem traits the items intend to measure, represented by the scale scores, were different for the 1983 sample and the 2003 sample. Only a few of the many items showed differential item functioning, and these effects

were only apparent when a very conservative criterion was used. It thus appears that response tendencies have not changed much over the years under investigation and do not form a threat to the comparison of samples that were assessed in different time periods.

In *Chapter 6*, we investigated the ten-year secular changes in service use among Dutch children. We compared the one-year prevalence of service use in two samples, assessed in 1993 and 2003. We investigated whether a change in service use could be explained by changes in the population levels of emotional and behavioral problems among Dutch children, and by changes in the distribution of several variables associated with service use. We found that service use increased from 3.5% in 1993 to 5.9 % in 2003. A large part of this increase could be explained by an increase in emotional and behavioral problems. Findings showed that another part of this increase was due to the fact that the proportions of children living in families other than a two family composition, and the proportions of children having educational problems, increased from 1993 to 2003. Since these variables are associated with service use, these societal changes have contributed to the increase in service use that was identified in this study.

In *Chapter 7*, the general conclusions of this thesis are discussed. Attention is paid to the most important conclusions of the different studies that were conducted, and results are discussed per age group. There were differences between trends found for the different age groups under investigation. The increase in parent-reported internalizing problems that was seen among school-age children was not confirmed by the small decreases in internalizing problem we found among the very young children. It does not appear plausible that measurement problems have contributed to this age group difference, since comparable samples and instruments were used. Perhaps very young children do not experience secular increases as a result of being less confronted with environmental changes.

Our findings also showed inter-informant differences. Secular changes were strongest in parent reports, less strong in self-reports, whereas teacher reports showed only a very few changes. Such differences may be due to different frames of reference that different informants use to judge children's behavior.

When we compare our findings to those of comparable studies that were conducted in other countries, cross-cultural variation appears. Such variation may be caused by differences in study designs, samples, instruments or time periods, but could also result from differences in societal developments between countries. When a longer period of time is being monitored, trends in children's mental health in the Western world may become more alike.

In the discussion, attention is also paid to the interpretation of the small trends we found in this study. Given the subject under investigation, these small trends may have a clear impact on our young population's need for mental health care. The small increase in parent-reported problems may lead to a substantial

increase in the absolute number of children with serious internalizing problems, who may be in need for care and are at risk for problems in several areas in their life. It needs to be kept in mind that we only focused on the Dutch speaking population. Several studies have shown non-Dutch children to have higher problem scores and we found significant effects of ethnicity on several scales, indicating that non-Dutch children had higher problem scores. Perhaps if we had included the non-Dutch speaking part of the population, which has grown substantially over the years, the identified trends would have been larger. The inclusion of these families needs to be addressed in future research.

Hence, we can conclude that this study has shown several indications that emotional and behavioral problems, as well as service use for mental health problems, have increased over recent decades among Dutch school age children. These increases were strongest between 1993 and 2003, and especially concern internalizing problems.

Samenvatting

SAMENVATTING

Tijden veranderen, evenals de omgeving waarin kinderen en adolescenten opgroeien. Vaak wordt gesuggereerd dat deze veranderende omgeving negatieve gevolgen heeft voor het welzijn van kinderen en adolescenten. Het doel van deze studie is om te onderzoeken of de emotionele en gedragsproblemen van Nederlandse kinderen over de afgelopen decennia zijn toegenomen.

In *hoofdstuk 1* is een algemene inleiding van deze studie gegeven, waarin aandacht wordt besteed aan de achtergrond waartegen deze studie plaatsvindt. In de nabije en minder nabije omgeving van kinderen hebben zich de afgelopen decennia een aantal maatschappelijke ontwikkelingen voorgedaan. Deze ontwikkelingen hebben mogelijk het welzijn van kinderen beïnvloed. Er zijn verschillende manieren om trends, of veranderingen, over tijd in het functioneren van kinderen in de bevolking te onderzoeken. De resultaten van verschillende studies hebben reeds gesuggereerd dat emotionele en gedragsproblemen zijn toegenomen onder kinderen en jongeren. Dergelijke bevindingen zijn vooral afkomstig van studies die gegevens over de prevalentie van psychiatrische diagnoses uit verschillende tijdsperiodes of van verschillende geboortecohorten hebben vergeleken, of van studies die zich hebben gebaseerd op gegevens over behandeling en patiëntenregistratie. Deze studies hebben echter een aantal methodologische beperkingen. De gebruikte gegevens zijn namelijk beïnvloed door veranderende diagnostische criteria, door beperkingen in de herinnering van mensen, door een toename in kennis over diagnoses en bijbehorende symptomen, of door veranderingen in de bereikbaarheid van zorg. Een meer directe methode om trends over tijd in de prevalentie van psychische problematiek van kinderen te onderzoeken is om representatieve bevolkingssteekproeven uit verschillende tijdsperiodes, die met dezelfde instrumenten zijn gemeten, met elkaar te vergelijken. Een beperkt aantal studies heeft op deze manier trends over tijd onderzocht. Het merendeel van de gedane studies heeft een aantal beperkingen, aangezien zij zich hebben gericht op een geringe leeftijdsrange, alleen schoolsteekproeven hebben gebruikt, een korte tijdsperiode hebben onderzocht, of informatie hebben ingewonnen bij slechts één informant.

In deze studie onderzoeken wij de trends over tijd in de prevalentie van emotionele en gedragsproblemen van kinderen in een brede leeftijdsgroep. Wij gebruiken hiervoor gegevens over bevolkingssteekproeven uit verschillende tijdsperioden. Deze gegevens hebben we ingewonnen bij verschillende informanten. We proberen de volgende vraagstellingen te beantwoorden: 1) In welke mate zijn er veranderingen over tijd te bespeuren in ouder-, leraar- en zelfgerapporteerde emotionele en gedragsproblemen van Nederlandse kinderen in de voorschoolse leeftijd, schoolleeftijd en adolescentie? 2) In welke mate zijn de rapportages van emotionele en gedragsproblemen in steekproeven uit verschillende tijdsperioden beïnvloed door een veranderende antwoordtendentie

van de respondenten? 3) Is er een trend over tijd te bespeuren in de prevalentie van zorggebruik voor psychische problematiek onder kinderen in de Nederlandse bevolking?

In *hoofdstuk 2* onderzoeken we de trends over tijd in ouder- en leraargerapporteerde emotionele en gedragsproblemen van Nederlandse 6- tot 16-jarigen. We vergelijken de probleemscores en competentiescores op de schalen van de CBCL en de TRF van drie onafhankelijke steekproeven, afkomstig uit respectievelijk 1983, 1993 en 2003. Op een aantal schalen van de CBCL laten de gemiddelde scores een stijging zien, met name tussen 1993 en 2003. Volgens criteria om effectgroottes te beoordelen, heeft slechts een beperkt aantal van deze stijgingen de grootte van een klein effect. Dit geldt voor de scores op de volgende schalen: angstig/depressief, somatische klachten en internaliseren. Leraarrapportages laten een kleine stijging op de schaal aandachtsproblemen zien. Voor verschillende probleemschalen van de CBCL en de TRF is er een toename zichtbaar in het percentage kinderen met een afwijkend hoge score. De resultaten van een analyse waarin we zowel de leraar- als ouderrapportage betrekken laten zien dat niet alleen het percentage kinderen met ernstige internaliserende problemen is toegenomen, maar ook het percentage kinderen dat met zowel ernstige internaliserende als externaliserende problemen te kampen heeft. De competentiescores laten een aantal dalingen zien in zowel ouder- als leraargerapporteerde competentie, met name tussen 1993 en 2003.

In *hoofdstuk 3* onderzoeken we de trends over tijd in oudergerapporteerde emotionele en gedragsproblemen van 2- en 3-jarige kinderen. Van twee steekproeven, afkomstig uit 1989 en 2003, vergelijken we de CBCL schaalscores en de percentages kinderen met een afwijkend hoge score op de verschillende schalen. De resultaten laten een daling zien in de gemiddelde scores op de schalen aandachtsproblemen en internaliseren. Ook de percentages kinderen met afwijkend hoge scores op deze schalen zijn afgenomen. Deze resultaten suggereren dat de emotionele en gedragsproblemen van hele jonge kinderen niet zijn gestegen in de periode 1989-2003. We vinden zelfs aanwijzingen voor kleine verbeteringen in het functioneren van deze jonge kinderen. Deze bevindingen komen niet overeen met de stijgingen die we zien onder kinderen in de schoolleeftijd, welke staan beschreven in *hoofdstuk 2*.

In *hoofdstuk 4* onderzoeken we de trends over tijd in zelfgerapporteerde emotionele en gedragsproblemen van Nederlandse adolescenten in de leeftijd van 11 tot 18 jaar. We vergelijken de YSR schaalscores en rapportages van politiecontact, suïcidale gedachten, zelfbeschadiging, dronkenschap en drugsgebruik van twee steekproeven adolescenten, één afkomstig uit 1993 en één uit 2003. We onderzoeken ook of trends verschillend zijn voor verschillende sociaaldemografische groepen. De externaliserende probleemscores van de YSR laten een kleine daling zien, terwijl zelfgerapporteerde suïcidale gedachten, zelfbeschadiging, dronkenschap en drugsgebruik zijn toegenomen in de periode 1993-2003. Een aantal trends verschillen voor jongens en meisjes. De scores op

sociale problemen en delinquent gedrag, evenals de totale probleemscore, laten alleen voor jongens een daling zien. De stijging in overmatig alcoholgebruik is veel sterker onder meisjes dan onder jongens. Omdat ook suïcidale gedachten en zelfbeschadiging meer prevalent zijn geworden, en deze gedragingen het meest voorkomen onder meisjes, lijken de trends die we vinden het functioneren van meisjes het meest negatief te hebben beïnvloed.

In *hoofdstuk 5* onderzoeken we of de antwoordtendenties van respondenten zijn veranderd in de periode 1983-2003. Dit zou het gevolg kunnen zijn van veranderingen in de bewoording van vragen, of van een toename in kennis over de uitgevraagde gedragingen. We vergelijken de CBCL- en TRF-invulling van de twee populatiesteekproeven uit 1983 en 2003. We onderzoeken of er sprake is van differentieel item functioneren (DIF), om te kijken of de relatie tussen de probleemitems en het onderliggend probleem verschillend is voor de twee steekproeven. Slechts een heel klein aantal items laat DIF zien. Deze effecten zijn overigens alleen significant wanneer we een conservatief criterium gebruiken. De antwoordtendentie van respondenten lijkt dus niet veel zijn veranderd over de jaren en lijkt geen bedreiging te vormen voor de vergelijkbaarheid van vragenlijstinvullingen van steekproeven die zijn gemeten in verschillende tijdperioden.

In *hoofdstuk 6* onderzoeken we de trends over tien jaar tijd in zorggebruik voor psychische problemen onder Nederlandse kinderen. We vergelijken de jaarprevalentie van zorggebruik in twee bevolkingssteekproeven, afkomstig uit 1993 en 2003. We onderzoeken ook in hoeverre een mogelijk stijging in zorggebruik verklaard kan worden door de toename in probleemscores van emotionele en gedragsproblemen van Nederlandse kinderen. Ook onderzoeken we in hoeverre veranderingen in de maatschappelijke distributie van variabelen die samenhangen met zorggebruik hebben bijgedragen aan een mogelijke stijging. We vinden dat zorggebruik is toegenomen van 3.5% 1993 tot 5.9% in 2003. Uit onze bevindingen blijkt dat een groot deel van deze toename kan worden verklaard door de toename in emotionele en gedragsproblemen van deze kinderen. Ook kan een deel worden verklaard door een toename in de proportie kinderen met een gezinsstructuur anders dan een twee-biologische-ouder-structuur, evenals door een toename in de proportie kinderen dat met leerproblemen te kampen heeft. Omdat deze kinderen bij de aanwezigheid van psychische problematiek meer gebruik maken van zorg, dragen deze ontwikkelingen bij aan de stijging in zorggebruik.

In *hoofdstuk 7* worden de belangrijkste conclusies van dit proefschrift bediscussieerd. De bevindingen worden per leeftijdsgroep besproken. De resultaten van deze studie laten een aantal verschillen zien met betrekking tot de trends in verschillende leeftijdsgroepen. De stijging in oudergerapporteerde internaliserende problemen die wij vonden voor kinderen in de schoolleeftijd, werd niet gevonden onder de 2- en 3-jarigen. Voor deze jonge kinderen was zelfs een kleine daling in problemen te zien. Het is niet erg aannemelijk dat

methodologische problemen aan dit verschil hebben bijgedragen, aangezien we in gebruik hebben gemaakt vergelijkbare onderzoekssteekproeven en instrumenten. Mogelijk worden hele jonge kinderen minder geconfronteerd met veranderingen in de omgeving, waardoor de problemen in deze leeftijdsgroep niet zijn toegenomen.

Onze bevindingen laten ook zien dat de gevonden trends verschillen per informant. De stijgingen zijn het sterkst zichtbaar in de ouderrapportage, minder sterk in de zelfrapportage, en de lerarenrapportage laat slechts een paar hele kleine stijgingen zien. Mogelijk ontstaan zulke verschillen doordat verschillende informanten verschillende referentiekaders hanteren om gedrag van kinderen te beoordelen.

Wanneer we onze bevindingen vergelijken met overeenkomstige studies die zijn uitgevoerd in andere landen, wordt crossculturele variatie zichtbaar. Dergelijke variatie is mogelijk een gevolg van verschillen in de onderzoeksopzet, in de gebruikte steekproeven of instrumenten, of in de gemeten tijdsperiodes. Ze kan ook het gevolg zijn van verschillen in de maatschappelijke ontwikkelingen binnen landen.

In de discussie wordt ook aandacht besteed aan de interpretatie van de kleine stijgingen die we vinden in deze studie. Gegeven het onderwerp van onderzoek kunnen deze kleine ontwikkelingen al een duidelijke impact hebben op de zorgbehoefte in de Nederlandse jonge populatie. De kleine gemiddelde stijging in oudergerapporteerde problemen heeft al een substantiële toename in het aantal kinderen dat volgens hun ouders veel emotionele problemen heeft tot gevolg. Deze kinderen hebben een mogelijke hulpbehoefte en lopen het risico om problemen te ontwikkelen op verschillende gebieden in hun leven. Het is ook belangrijk om te beseffen dat wij ons in dit onderzoek alleen gericht hebben op de Nederlandssprekende populatie. Verschillende onderzoeken hebben aangetoond dat kinderen van een niet-Nederlandse achtergrond hogere probleemscores hebben dan Nederlandse kinderen. Dit wordt bevestigd door de significante effecten van etniciteit die wij in dit onderzoek vinden. De gevonden stijgingen waren dus waarschijnlijk sterker geweest indien we ook het niet-Nederlandssprekende deel van de populatie, welk een groeiend aandeel in de Nederlandse samenleving heeft, hadden geïncludeerd in dit onderzoek. De inclusie van niet-Nederlandssprekende gezinnen is een belangrijk punt om mee te nemen in toekomstig onderzoek.

Concluderend kunnen we stellen dat er verschillende aanwijzingen zijn dat emotionele en gedragsproblemen, evenals het zorggebruik voor psychische problematiek, zijn toegenomen onder Nederlandse kinderen in de schoolleeftijd. De toename in problemen was het sterkst tussen 1993 en 2003, en betrof met name internaliserende problematiek.

Dankwoord
Curriculum Vitae

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CURRICULUM VITAE

Nouchka Tamar Tick werd op 12 mei 1979 geboren te Rotterdam. In 1997 behaalde zij haar Gymnasiumdiploma aan het Emmauscollege te Rotterdam en in september 1997 startte zij haar studie Psychologie aan de Universiteit van Utrecht. Na het behalen van de Gammapropedeuse en het eerste doctoraaljaar Psychologie koos zij voor de afstudeerrichting Ontwikkelingspsychologie. In december 1999 stapte zij over naar de Universiteit van Amsterdam, waar zij haar studie vervolgde binnen de afstudeerrichting Klinische Ontwikkelingspsychologie. Haar afstudeeronderzoek richtte zich op de relatie tussen psychopathologie en schuldgevoel onder kinderen in de basisschoolleeftijd. Ook schreef zij een literatuurscriptie, waarin zij zich richtte op de vraag in hoeverre de visie van een aantal klassieke psychoanalytici op de emotie schuld is terug te vinden in de hedendaagse conceptualisatie van de emotie schuld. Voor haar scriptie en afstudeeronderzoek stond zij onder begeleiding van dr. Jan Hoeks. Van september 2002 tot juli 2003 liep zij haar afstudeerstage binnen het Kinderteam van de Meren, instelling voor jeugd GGZ, te Amsterdam Oost. Tijdens haar afstuderen gaf zij onder andere voorlichtingslessen over roken en alcoholgebruik aan kinderen in het basisonderwijs. Dit deed zij in het kader van een onderzoek van de afdeling Kinder- en Jeugdpsychiatrie van het Erasmus MC- Sophia Kinderziekenhuis naar effecten van preventie op middelenmisbruik onder kinderen. Op 29 augustus 2003 rondde zij haar studie psychologie af aan de UvA. Vanaf september 2003 was zij als junior onderzoeker verbonden aan het Erasmus MC- Sophia Kinderziekenhuis, waar zij een promotieonderzoek uitvoerde binnen de afdeling Kinder- en Jeugdpsychiatrie, onder begeleiding van haar promotor Prof.dr. Frank C. Verhulst en onder dagelijkse begeleiding van drs. Jan van der Ende. Voor dit promotieonderzoek verzamelde zij data over de prevalentie van emotionele en gedragsproblemen in de Nederlandse bevolking en beschreef de onderzoeksresultaten van een studie naar trends over tijd in emotionele en gedragsproblemen onder kinderen en adolescenten in de Nederlandse bevolking. De resultaten van dit promotieonderzoek staan beschreven in dit proefschrift.