Mental health from a life-course perspective
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General discussion
Chapter 7

The overall aim of the thesis was to assess the impact of mental health problems from childhood to young adulthood on the school-to-work transition from a life course perspective. In this general discussion the main findings of this thesis are summarized and discussed. The methodological issues and implications for both practice and research are addressed.

Main findings
We examined associations of mental health problems from childhood to young adulthood with educational and employment outcomes in young adulthood with five research questions. Our main findings are summarized below.

The first research question (Chapter 2) was:

Are mental health problems in childhood and changes in mental health problems between childhood and adolescence associated with educational attainment in young adulthood?

We found that adolescents’ mental health problems and changes over time in mental health problems, had a strong, negative effect on educational attainment in young adulthood. Mental health problems in childhood were associated with low levels of educational attainment in young adulthood, but after adjustment for comorbidity, only the association for attention problems remained significant. For both boys and girls, increasing externalizing problems during adolescence, were associated with a low level of educational attainment in young adulthood. Only among girls, increasing internalizing problems were associated with a low level of educational attainment. We found no significant association between adolescents’ increasing attention problems and educational attainment.

The second research question (Chapter 3) was:

Do mental health problems in adolescence explain the relationship between childhood adversities and educational attainment in young adulthood?

Only among boys, childhood adversities had a strong and negative impact on educational attainment in young adulthood. For a small part, this association can be explained by externalizing problems in adolescence. Externalizing problems in adolescence negatively affected educational attainment for both boys and girls, regardless the exposure to childhood adversities. Internalizing and attention problems in adolescence did not explain the association between childhood adversities and educational attainment in young adulthood.
The third research question (Chapter 4) was:

*Do trajectories of mental health problems from childhood to young adulthood affect the educational and employment status of young adults?*

We identified four trajectories of total and externalizing problems from childhood to young adulthood: a high-stable, a decreasing, a moderate-stable and a low-stable trajectory. For internalizing problems we also found a moderate-low trajectory. For attention problems, we found a high-stable, moderate-stable and low-stable trajectory. Except for the decreasing trajectory, all trajectories were relatively stable over time. Young adults were at higher risk of adverse educational or employment status, when having a history of high-stable total or externalizing problems.

The fourth research question (Chapter 5) was:

*What is the role of educational attainment in the association between depressive symptoms in adolescence and labor market participation in young adulthood?*

In this study in Denmark, among girls, depressive symptoms during adolescence had a negative impact on labor market participation in young adulthood, and this association was partly explained by educational attainment. Among boys, only depressive symptoms early in adolescence had a negative impact on labor market participation. For both boys and girls, educational attainment did not moderate the association between depressive symptoms and labor market participation.

The fifth research question (Chapter 6) was:

*Do trajectories of mental health problems from childhood to young adulthood affect the employment conditions and psychosocial work characteristics of young adults?*

For both externalizing and internalizing problems, four trajectories were identified: high-stable, decreasing, moderate-stable and low-stable. Except for the decreasing trajectory, all trajectories were relatively stable over time. Young adults with high-stable trajectories of externalizing problems reported better employment conditions, compared to young adults with low-stable trajectories. Young adults with a history of internalizing problems reported at average poorer employment conditions and psychosocial work characteristics compared to their healthy counterparts.
Discussion of the main findings
We found that mental health problems from childhood to young adulthood were persistent over time and had a strong and negative impact on educational and employment outcomes. The results of this study may help to identify groups at risk for problematic school-to-work transitions and to develop interventions targeting these high-risk groups. A considerable number of adolescents have to deal with the burden of mental health problems, and the economic costs of early mental health problems are enormous, i.e., a lifetime loss of family income of 300,000 USD per year. In the following sections, we discuss our main findings, compare them with other studies and provide explanations.

Mental health problems from childhood to young adulthood
We found that 17% of our study sample reported high levels of mental health problems from childhood to young adulthood, which where around or just above the borderline clinical range. About 19% of the adolescents reported high levels of externalizing problems and 8% reported high levels of internalizing problems, the latter being above the borderline range. The percentages of total and externalizing problems are comparable with previous research, but numbers for internalizing problems are relatively low, i.e., 8% in the present study versus 28% in other studies. However, 35% of the participants showed moderate-stable trajectories of internalizing problems, indicating that still a considerable proportion of adolescents has to deal with the burden of these problems. The trajectories of mental health problems as identified from childhood to young adulthood were mostly (i.e., 85 to 90%) relatively stable over time, which is in line with prior research.

Mental health problems and educational attainment
Externalizing problems in adolescence had a negative effect on educational attainment in young adulthood. In addition, also an increase of externalizing problems during adolescence was associated with a low level of educational attainment. Our findings are in line with previous studies, which were conducted mainly in US, indicating that externalizing problems have an negative impact on educational attainment, not only in a liberal welfare system, but also in a social-democratic welfare system as the Netherlands. Externalizing problems regard behavior toward the environment and others. They are therefore easily noted in the classroom, as they may distract adolescents and their classmates. As a result,
adolescents with externalizing problems are more often dismissed or play truant compared to adolescents without these problems. Also, these adolescents tend to have delinquent peers, which may reinforce their problematic behavior. Externalizing problems are thus likely to have a negative impact on the school performance of adolescents, and, eventually, on their educational attainment in young adulthood. In general, boys tend to have higher levels of externalizing problems, but we found no gender differences for the association with educational attainment.

For internalizing problems, we found that an increase of problems during adolescence was associated with an at average lower level of educational attainment in young adulthood, but only among girls. In contrast, internalizing problems in early adolescence did not affect educational attainment in young adulthood. An explanation may be that internalizing problems essentially cause no major problems for educational attainment: adolescents with such problems may e.g., spend relatively many hours on school work due to fear of failure. Moreover, others, for example the teacher or classmates, are mostly not affected by their problems, as internalizing problems are directed toward the self, internally. However, if internalizing problems increase during adolescence, they may be indicative of downward cycle, which ultimately negatively affects educational attainment: too much fear for failure, too much anxiety. This may in particular affect girls, who already have higher mean levels of internalizing problems than boys during adolescence.

Attention problems during adolescence were strongly associated with educational attainment in young adulthood. Attention problems, i.e., difficulties with concentration, daydreaming, etc., are likely to lead to difficulties at school when children have to listen to instructions, finish school work and have to stay focused. These difficulties have a negative impact on school performance and thus on educational attainment. Furthermore, children with attention problems are less popular at school and their relationships with peers are poor due to social difficulties, which, at average, may result in poorer academic performance.

We found that childhood adversities were associated with poorer educational outcomes in young adulthood, but only among boys, and that this association was partially mediated by externalizing problems. Previous studies showed an association between childhood adversities and educational outcomes, but did not stratify by gender. Our gender-specific association may be due to gender differences in the level of effortful control, i.e., the ability to regulate responses to
external stimuli. In general, boys have lower levels of effortful control than girls. This lower mean level of effortful control may increase the risk of developing externalizing problems and hence the risk of poor educational attainment. Bakker et al.\textsuperscript{25} demonstrated that adolescents who have been exposed to childhood adversities had lower risks of developing externalizing problems when having high levels of effortful control. Moreover, a study of Karreman et al.\textsuperscript{26} showed that effortful control was more strongly associated with externalizing problems among boys than among girls.

The influence of mental health problems on employment and work outcomes
Externalizing problems were positively associated with employment outcomes, i.e., young adults with high- or moderate-stable trajectories of externalizing problems worked more hours and were more likely to have a higher income than young adults with decreasing or low trajectories of externalizing problems. It might be that these young adults left school early because of a mismatch between their externalizing problems and the educational system, and not because of too few competencies. These young adults may have relatively many competencies given their educational level, and may therefore be appealing for employers. This could result in better employment conditions when entering the labor market, but the sustainability of their employment conditions deserves further research. Another explanation is that these young adults received extra support in their transition from school to work. As young adults with externalizing problems have a higher risk of low educational attainment and school dropout\textsuperscript{9,11}, they are likely to have received support to, for example, achieve a basic educational level or to find a job. This support may have resulted in better employment conditions. We cannot assess this explanation as information on received support is not available.

Internalizing problems were negatively associated with employment and work outcomes. Regarding employment outcomes, young adults with internalizing problems during adolescences reported poor labor market participation, lower income and worked less hours in young adulthood, compared to healthy young adults. Furthermore, young adults with internalizing problems reported poorer psychosocial work characteristics, including higher levels of quantitative demands and lower levels of possibilities of development, meaning of work and of job satisfaction. Our findings regarding employment outcomes, confirms previous research\textsuperscript{27,28} i.e., early mental health problems were associated with poor labor market participation and low income. We cannot compare our findings concerning
psychosocial work characteristics with other studies, as we are the first study on this topic.

To explain the complex association between internalizing problems and work outcomes, the literature on mental health provided two hypotheses: the drift hypothesis and the gloomy perception hypothesis.\textsuperscript{29,30} According to the drift hypothesis, employees with (mental) health problems have a higher risk of drifting off to jobs with poor employment conditions, due to higher rates of absenteeism or unemployment. The gloomy perception hypothesis suggests that employees with (mental) health problems interpret their work environment negatively over time. However, our findings regarding internalizing problems cannot be explained by either one of these hypotheses. Our results showed that young adults with a history of internalizing problems have poorer jobs, regardless of and not due to their perception, i.e., the gloomy perception hypothesis does not explain this. Next, as our participants just entered the labor market, our findings cannot be explained with the drift hypothesis either. Therefore, based on the results of this study we can conclude that young adults with early internalizing problems face a more difficult start at the labor market, compared to healthy young adults. A possible explanation is that young adults with internalizing problems have lower levels of energy, concentration and motivation, which eventually result in poorer employment conditions.\textsuperscript{31}

**The transition from school to work**

For some young adults, i.e., 7.5\% (120 out of 1711 study participants), the history of mental health problems was associated with a problematic transition from school to work. Young adults with total or externalizing problems were more likely to work without a BEL or to be in NEET. These young adults have poor prospects regarding employment conditions, financial security and health status.\textsuperscript{32} A recent study of Goldman-Mellor et al.\textsuperscript{33} showed that young adults in NEET were more actively seeking for a job than peers not in NEET. These findings suggest that young adults in NEET are highly motivated to be employed, but are hindered by their history of or current state of mental health problems. Consequently, these young adults might enter a downward spiral, in which being motivated to work but being unable to find a job may affect their mental health status negatively.\textsuperscript{34}
Methodological considerations

In this section, we address and discuss methodological issues concerning the study sample, the quality of obtained data, and the attribution of causality and confounding.

Study sample

For this thesis we used data of two longitudinal, general population-based study samples with high initial response rates, i.e., 76.0% (TRAILS) and 83.0% (Vestliv) and high overall retention rates during follow-up, i.e., >75% (TRAILS) and >70% (Vestliv). Selection bias might have occurred, i.e., bias due to factors determining participation that also affect study outcomes, as participants may have refused to participate due to their mental health problems. This may have led to some underestimation of the rates of mental health problems and associated problems such as a difficult start at the labor market. However, assessment of non-respondents and dropouts, showed that TRAILS respondents and non-respondents did not differ regarding mental health problems at age 11 years, and neither did so dropouts compared with retainers at age 19 years.

Quality of the obtained data

Misclassification of exposure variables

As measures of mental health problems, we used self-reported and parent-reported data obtained with reliable and valid measures (i.e., YSR, CBCL and CES-DC). We did not use a diagnostic interview, i.e., the gold standard for psychiatric diagnoses, to assess mental health disorders. We were interested in both mild and severe mental health problems, and our approach may function as an early indicator of mental health disorders. With repeated measures, we were able to examine the course of these problems over time (Chapters 2, 3, 4 and 6).

Data for internalizing, externalizing and attention problems were missing for 6.8% to 24.8% of respondents (Chapters 2, 3, 4 and 6). This might have caused some bias if data was not missing at random (e.g. adolescents did not participate due to their mental health problems). However, analyses of complete cases (Chapter 3, 4 and 6) and of imputed data (Chapter 2) versus original data (i.e., with missing data) yielded very similar results, making this bias unlikely.

The likelihood of information bias, i.e., systematic error in the obtained information, was further limited by the use of multiple informants (Chapter 2) and repeated measures (all chapters). More specifically, in Chapter 4 and 6 we
used repeated measures of mental health problems to identify trajectories. These trajectories of mental health problems provided a more accurate and reliable representation than mental health problems measured at one time point. For example, two persons may report the same level of mental health problems at a given point in time, but were categorized into different trajectories (e.g., decreasing and moderate-stable trajectories).

**Misclassification of outcome variables**

We assessed the level of educational attainment based on self-report of the highest obtained diploma or current educational level in young adulthood (Chapters 2, 3, 4 and 6). For some young adults, at that age, the level of educational attainment has not yet settled, i.e., the level of educational attainment may still increase. For example, participants who were classified with a low level of educational attainment might finish secondary education later on, i.e., they will reach a medium or high level of educational attainment. Furthermore, participants who were in higher secondary education, where classified with a high level of educational attainment, assuming that these participants will continue with tertiary education. If our assumption is not correct, this might have caused random measurement error, i.e., non-differential misclassification might have occurred. This would imply that our results are an underestimation of the true educational level, as non-differential misclassification always biases towards the null.\(^\text{35}\) Finally, self-reports may have been incorrect, i.e., respondents may have reported a too high level of their own education. Evidence lacks on whether self-reported educational level is sensitive for social desirability with some participants overestimating their level. In Chapter 5, the level of educational attainment and labor market participation was derived from national registers.

We classified participants as being in NEET when they were not at school or at work (Chapter 4). In some cases, this NEET status may have been transitional, i.e., participants may have been temporarily in NEET. This may have been due to having a temporary break from school or work, for example to travel the world. It is rather likely that misclassification has occurred in at least some instances, which may have caused random measurement error. Consequently, our results are then an underestimation of the true association as such a random error will cause a bias towards the null.
Attribution of causality and confounding

Causality

A major strength of the design of both the TRAILS and Vestliv study was that mental health problems were measured before participants were exposed to the work environment. This design allowed to identify trajectories of mental health problems of childhood to young adulthood among starters at the labor market. Although we cannot unravel cause and effect, our findings indicate that early mental health problems determine educational and employment outcomes in a subsequent life stage, i.e., young adulthood. Caution is warranted about causal inferences regarding the association of mental health problems with educational and employment outcomes. This association may be due to cyclic causality, i.e., a causal chain during the life course. That is, the level of educational attainment in young adulthood is a consequence of the educational track followed since childhood, which is likely to be influenced by mental health problems in childhood and adolescence. In turn, the level of educational attainment may affect mental health problems later in life. Subsequently, employment conditions follow, in general, the level of educational attainment, i.e., a low level of educational attainment is linked to lower income and higher unemployment rates and a high level of educational attainment to higher income and lower unemployment rates.42

Another concern is the likelihood that the development and course of mental health problems and adverse educational and employment outcomes have a common cause, i.e., a factor that negatively affects both mental health problems and educational and employment outcomes. Possible factors that may act as a common cause are parental educational level, intelligence of the child or exposure to negative life events.

Confounding

The focus of this thesis is a life course perspective linking mental health problems from childhood to young adulthood to educational and employment outcomes in young adulthood. To exclude that this association was distorted by factors such as age, gender, parental educational level, intelligence of the child or exposure to negative life events, all analyses were adjusted for these factors. Although we accounted for these factors, we may not have accounted for all possible confounding factors, e.g., ethnicity or gestational age.
Implications

In this section, the implications of this study for policies, practices and further research are discussed.

Implications for policies and practices

We found that mental health problems from childhood to young adulthood were persistent over time, indicating that early detection of these problems is needed. Early detection can start at a very young age, i.e., mental health problems in adolescence can be predicted by mental health problems at age 3 years.\textsuperscript{5,43,44} Externalizing problems in adolescence are more predictive than internalizing problems by early mental health problems,\textsuperscript{5,43,44} probably due to the fact that the environment is more affected by externalizing problems and internalizing problems are not always apparent for others.

However, early detection is of no use without treatment. Our findings suggest that the earlier high-stable trajectories of mental health problems are bent into decreasing or lower-stable trajectories, the better. A recent study of Jörg et al.\textsuperscript{45} showed the same among young adults, i.e., only one third of young adults with a psychiatric diagnosis received mental health care. Interestingly, among the health care users, externalizing problems were most prevalent, whereas among the non-users internalizing problems where more prevalent. These findings indicate that health care utilization is not optimal and needs improvement, especially given the long-term consequences of these mental health problems in terms of adverse educational, employment and work outcomes.

Schools may play an important role in the detection and initiation of mental health problems. Since the introduction of the Act of Tailored Education in 2014, cooperation of schools and youth health care services has priority among Dutch policymakers. Furthermore, since January 2015, municipalities are responsible for the execution of youth care, which is established by the Act of Youth (in Dutch: Jeugdwet). Major aims of this decentralization of youth care are to simplify the management of care, to improve cost effectiveness, and to enhance collaboration between different care providers.\textsuperscript{46} Until the introduction of the Act of Youth, youth had the right to receive care and support, but this right has been changed into a duty of care of municipalities. Critics are afraid that specialized care (e.g., child psychiatry) is no longer available for youth with severe problems. The long-term outcomes of the decentralization of youth care are unclear yet. Our findings indicate that young adults with mental health problems form a vulnerable group,
especially given the severe consequences regarding educational, employment and work outcomes. This group is in need of high quality care to improve their mental health problems in adolescence and their quality of life and, subsequently, to reduce socioeconomic health differences in adulthood. The challenge is to provide high quality care adequately.

We found that several young adults experience a particular problematic transition from school to work, i.e., they were at work without a BEL or were in NEET, and that this was associated with high-levels of mental health problems from childhood to young adulthood. Alongside the problems of this vulnerable group, they may be in-between care services, causing them to miss adequate support and care. More specifically, they are too old for the youth care system and not covered by the occupational health care system as they are not active at the labor market. To counteract this risk, collaboration between schools, youth health care services, future employers and occupational health care services is warranted. In 2013, a contact moment at the age of 16 years has been introduced in preventive child health care.47,48 This contact moment might give the opportunity to integrate knowledge and experience of occupational health care. This additional contact might be helpful to collaboratively monitor mental health problems in view of educational progress and to discuss future employment plans with adolescents. Occupational physicians need to be informed about the history of mental health problems of adolescents to evaluate the risk of adverse employment and work outcomes and to accommodate the workplace. Furthermore, initiatives for youth career support should take the impact of mental health problems into account, as our results suggest that a history of mental health problems caused adverse educational, employment and work outcomes among young adults in NEET. These young adults might need extra help to improve their skills to find a job and to maintain in the labor market.

**Implications for future research**

We found that mental health problems persist from childhood to young adulthood and negatively affect later life educational and employment outcomes. While Viner and colleagues5 stated that adolescence may be a critical period for later health and disease, our results suggest that adolescence may also be a critical or sensitive period for educational, employment and work outcomes. This shows the need for adopting a life course perspective: events in different life stages cannot be fully understood apart from each other. Although life course research in social science
has matured and became widespread in the past decades, research linking early mental health problems to educational, employment and work outcomes still needs attention and improvement. To validly study the impact of mental health problems on educational, employment and work outcomes by adopting a life course perspective, new cohorts should, like the TRAILS cohort, be identified before exposure to the work environment. Furthermore, future research should include the wider social context of young adults as their context affects educational, employment and work outcomes.

In this thesis, young adults were followed until the age of 22 years, but a longer follow-up is needed to examine if and how early mental health problems track into adulthood. A longer follow-up is also needed to improve our understanding of the long-term consequences of early mental health problems regarding employment and work outcomes.

The results of our study suggest that young adults with a history of internalizing problems actually get poorer jobs, eventually resulting in poorer perceptions of their work environment. To our best knowledge our study is the first study examining early mental health problems to the psychosocial work characteristics in young adulthood. Therefore, future research is needed to confirm our findings. Furthermore, comparison of young adults with and without a history of mental health problems holding the same types of jobs is needed to deepen our knowledge and understanding of perceived psychosocial work characteristics. Comparing young adults with the same type of jobs, allows to disentangle whether a poor perception of the work environment is due to the perception of the young adult or that the young adult selected him- or herself into a poor work environment.

Conclusion
In sum, we found that the majority of mental health problems from childhood to young adulthood were persistent over time and had a negative effect on later life outcomes. Young adults with a history of externalizing problems were at risk of low educational attainment and of a poor transition from school to work. A history of internalizing problems was associated with poor employment conditions, labor market participation and lower levels of psychosocial work characteristics. The results of our study clearly showed that early mental health problems have severe consequences for later life, i.e., negatively affect educational and employment status in young adulthood. Therefore, mental health problems should be detected
and treated early in life (i.e., in childhood and early adolescence), given its persistence over time and severe consequences regarding health and work during the life course.
REFERENCES


General discussion


