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ACT TREATMENT FOR YOUTH – A Contextual Behavioral Approach

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To Lo, Leon, & Alve, and the rest of humanity.

“Love isn’t everything; it’s the only thing.”

ABSTRACT

Background: Mental and substance abuse disorders in children and youth are the leading cause of disability in the world. According to the World Health Organization (2018), approximately 20% of the world's children and adolescents suffer from mental health disorders or problems. Mental health problems among youth have increased between 1950 and 2016, and Sweden stands out, with a marked increase in internalizing mental health symptoms, even when compared to other Scandinavian countries. Increases are as sharp for both boys and girls, but girls report more problems. The most common problems include symptoms of anxiety, depression, and stress, and they often come together. To address those problems, we need to intervene on a societal level as well as helping youth directly. We can and should help at different levels and stages of these problems; helping youth at early stages can spare them a lot of suffering. To scale up the availability of treatments, we need to transfer some treatment delivery from highly specialized staff to less-specialized staff. We also need to understand what causes mental health problems and how effective treatments work. To this end, acceptance and commitment therapy (ACT) is promising, along with the construct of psychological flexibility (PF). There is initial support for using ACT for youth mental health problems; however, more research is needed.

Aims: The overall aim of this thesis was to test and develop transdiagnostic group treatments for different youth populations. We wanted to test the interventions under real-world conditions when delivered by less-specialized staff. And to begin understanding possible mechanisms of change, we did the first replication on youth of the psychometric properties of the instrument Avoidance and Fusion Questionnaire for Youth (AFQ-Y) for detecting the PF construct. We also wanted to explore whether PF mediated the outcomes in one of the studies. The specific aims were as follows:

Study I*:* Test the effectiveness of a brief transdiagnostic ACT group intervention in helping youth with subthreshold symptoms of stress and depression, and test it under real-world conditions in schools when delivered by less-specialized staff.

Study II*:* Test the psychometric properties of the instrument AFQ-Y, see how it works in Swedish, and check the validity and reliability of the shorter form of the instrument (AFQ-Y8).

Study III*:* Test the effectiveness and feasibility of a brief transdiagnostic ACT group intervention for youth with comorbid problems in residential care. We also wanted to see whether increased PF mediated potential positive outcomes, and to test it under real-world conditions in residential care when delivered by less-specialized staff.

Methods: In **Study I** we screened 247 youth (ages 14 through 15) in a Swedish public high school. Students with stress and mental health problems were invited to participate. Thirty-two youth were randomized to either get the ACT intervention or be referred to individual support from the school nurse (treatment as usual, or TAU). In Australia we included 66

youth (12 through 18 years) with mild to moderate depressive symptoms from five schools and randomized them to ACT or TAU.

In **Study II** we used data collected in the study described in Paper III to assess the psychometric properties of AFQ-Y17 and AFQ-Y8.

In **Study III** we included 160 adolescents (ages 15 through 20) with psychosocial problems who had been mandated to inpatient residential care. Ninety-one youth at five sites received the addition of a 12-hour ACT group intervention on top of treatment as usual (TAU+ACT), and the remaining 69 youth at three matched sites received only TAU. The ACT intervention was delivered by regular ward staff without formal psychotherapeutic training. We measured participants at five time points over an 18-month period.

Results: In **Study I,** results demonstrated that ACT in group format reduced the primary outcomes of youth stress and depression, with large effect sizes compared to the control group. In the Australian study, youth increased their PF with a large effect size. In the Swedish study, we observed marginally significant decreases of anxiety and increased mindfulness skills, with large and medium effect sizes, respectively. Participants in both Sweden and Australia reported liking the ACT intervention.

In **Study II,** both the AFQ-Y17 and AFQ-Y8 demonstrated adequate psychometric properties.

In **Study III,** the addition of ACT in group format reduced the primary outcomes of youth depression and anxiety, with small effect sizes compared to TAU alone at post-treatment. Effects were not significant at 18-month follow-up but continued to favor ACT, with small effect sizes. At post-treatment, increased PF mediated the reductions in anxiety. On the secondary outcomes of hyperactivity, peer problems, and better psychosocial functioning at large, effects in favor of ACT were found, all with small effect sizes. The improvements with fewer peer problems and better psychosocial functioning were observed in both youth self-reports and reports from treatment staff at the treatment unit.

Conclusions: ACT as a short transdiagnostic group treatment is effective in reducing youth stress, symptoms of depression, and possibly anxiety when tested under real-world conditions in schools and when delivered by less-specialized staff. Adding a short transdiagnostic ACT group treatment on top of TAU for youth with comorbid problems in residential care is one way to reduce symptoms of depression and anxiety and other problems, such as fewer peer problems, reduced hyperactivity, and better overall psychosocial functioning. Increased PF mediated the reduction in anxiety. The AFQ-Y8 is a reliable, valid, and brief instrument for measuring PF among youth, with broad clinical and research utility.

LIST OF SCIENTIFIC PAPERS

Paper I. Livheim, F., Hayes, L., Ghaderi, A., Magnusdottir, T., Högfeldt, A., Rowse, J., Turner, S., Hayes, S. C., & Tengström, A. (2015). The effectiveness of acceptance and commitment therapy for adolescent mental health: Swedish and Australian pilot outcomes. *Journal of Child and Family Studies, 24*(4), 1016–1030. doi:10.1007/s10826-014-9912-9

Paper II. Livheim, F., Tengström, A., Bond, F. W., Andersson, G., Dahl, J., & Rosendahl, I. (2016). Psychometric properties of the Avoidance and Fusion Questionnaire for Youth: A psychological measure of psychological inflexibility in youth. *Journal of Contextual Behavioral Science, 5*(2), 103–110. doi:10.1016/j.jcbs.2016.04.001

Paper III. Livheim, F., Tengström, A., Andersson, G., Dahl, J., Björck, C., & Rosendahl. I. (Manuscript). A quasi-experimental, multicenter study of acceptance and commitment therapy for antisocial youth in residential care.

CONTENTS

LIST OF ABBREVIATIONS

AARR	arbitrarily applicable relational responding
AAQ-II	Acceptance and Action Questionnaire
ACE	adverse childhood experience
ACT	acceptance and commitment therapy/training
AFQ-Y	Avoidance and Fusion Questionnaire for Youth
ANS	autonomic nervous system
CBT	cognitive behavioral therapy
DSM	Diagnostic and Statistical Manual of Mental Disorders
HPA	hypothalamic-pituitary-adrenal axis
ICD	International Classification of Disease
LGBT	lesbian, gay, bisexual, and transgender
MDD	major depressive disorder
MMRM	mixed-model repeated measure
MRI	magnetic resonance imaging
PF	psychological flexibility
PSHC	psychosomatic health complaints
RCT	randomized controlled trial
RFT	relational frame theory
SEL	social and emotional learning
SMI	stress management intervention
TAU	treatment as usual

1 INTRODUCTION

Being human is not always easy; at least, that has been true for me. And in working for 10 years, off and on, as a schoolteacher with youth, and working as a clinical psychologist for 13 years, I have met many fellow human beings also struggling in life. This often brings to mind a quote by three of the founders of ACT: "The single most remarkable fact of human existence is how hard it is for humans to be happy" (Hayes, Strohsahl, & Wilson, 1999).

From all my encounters with others' suffering and from living with my own arose an urge to help alleviate this pain, and to help others and myself to live vital and fulfilling lives.

When I started working as a clinical psychologist, my professional values statement evolved into "How can I help as many as possible as effectively as possible?" My way of living that value as a psychologist has meant following a pretty simple four-step recipe:

1. Given the problem at hand, what do research and theory say are the most effective ways to help?
2. Refine that knowledge and write treatment protocols.
3. Test the treatment in well-designed studies to see whether they work, and if they do, can we determine *why* they work?
4. If the treatments works, train other professionals and nonprofessionals in how to deliver the interventions to people in need.

Working with this thesis has been a way to focus time and energy to develop my knowledge about finding effective ways to help youth and adults. I have devoted this time to poring through research, developing and testing treatment protocols, and learning how to conduct clinical trials.

I would say that the results in this thesis are promising. And this thesis is also a reminder of how much more needs to be done when it comes to developing, testing, and disseminating evidence-based treatments for youth.

Fredrik Livheim

Stockholm, January 2019

2 BACKGROUND

2.1 YOUTH MENTAL HEALTH: STRESS, DEPRESSION, COMORBIDITY, AND ALCOHOL/DRUGS

Mental health and substance abuse disorders in children and youth are the leading cause of disability in that population (Erskine et al., 2015). According to the World Health Organization (2018), approximately 20% of the world's children and adolescents are suffering from mental disorders or problems. In this background, I aim to put youth mental health into context by examining whether mental health problems has increased over time, reviewing how we conceptualize mental health problems, and considering whether this conceptualization can be problematic. This background also covers risk factors for youth mental health disorders, treatments for them, and definitions of stress and depression. Finally, I will highlight a factor that might be an important key for understanding and treating mental health problems among youth: psychological flexibility (PF).

2.1.1 Youth mental health problems: An increasing problem?

There has been an increased reporting of youth mental health problems in the last decade, especially in the developed countries. Youth and adolescence has probably always been a challenging phase in life. There are many transitions in this period that require adaptation and flexibility: major bodily and hormonal alterations, finding one's own identity, fitting in with peers, and becoming more independent of parents. In the light of this, it is helpful to understand a wider context for the development of mental health problems over time. Are mental health problems increasing among youth? Is today's general population of youth more at risk for mental health problems then earlier generations? Or is it just stressful and challenging, overall, to be young?

Several reviews have looked into whether mental health problems among adolescents have been increasing or not from 1950 to the time of this writing (December 2018). Individual studies reveal different time trends; some results show a decreasing trend for adolescent mental health problems; others show a stable trend, and still others an increasing trend. But from large reviews of individual studies, a pattern starts to emerge. I will offer the broad strokes.

A comprehensive review by Rutter and Smith (1994) shows a substantial increase in mental disorders in young people from the 1950s to the 1990s. Several other meta-analyses give further support. Two examples are meta-analyses from the United States and China. Twenge et al. (2010) looked at time trends between 1937 and 2007 among young people from a general population in the United States. They found a large generational increase in psychopathological symptoms during this time span. The Chinese study (Xin et al., 2012) synthesized data from four cross-temporal Chinese meta-analyses that looked at time trends for birth cohorts between 1992 and 2005, concluding that Chinese adolescents' mental health deteriorated across birth cohorts. This was shown in increased scores for mental health problems, including anxiety and depression.

The evidence for an increase in metal health problems worldwide between 1950 and 1990 is accumulating. This is somewhat confusing, given that during this time period there were significant improvements in living conditions that usually would have a positive impact on mental health. A relevant question is what the situation looks like from 1990 onward.

A systematic review by Bor et al. (2014) covered 19 epidemiological studies from 12 different countries over the time span 1985 to 2010. They found that the burden of adolescent externalizing problems (such as drug use, rule-breaking, and ADHD) appears to be stable. However, internalizing problems (mental health complaints and symptoms) is increasing among adolescent girls. When it comes to adolescent boys, the findings were mixed.

A recent systematic review and meta-analysis was conducted by Potrebny et al. (2017). It included children's and adolescents' (ages 10 through 19) experiences of mental health from a sample covering over seven million adolescents and children between 1982 and 2013. This sample covered 36 countries, in Europe, as well as Canada, the United States, Israel, and New Zealand. This study is based on self-reported psychosomatic health complaints (PSHC). Nearly all of the 21 included studies reported a higher prevalence of PSHC among girls then boys.

When including all countries, the conclusion is that between 1980 and 2000 it seems there may have been a minor increase in self-rated psychosomatic health complaints. This trend became more stable between 2000 and 2010. However, subgroup analyses in Northern Europe (the Nordic countries, including the Baltic states and Greenland) showed a trend different from other subregions. The only subregion with a clearly significant increasing trend in adolescent PSHC was Northern Europe, with a minor increase between 1982 and 2013.

This case of increased PSCH in Northern Europe is a bit of a paradox: the Nordic countries are considered to have excellent prerequisites for adolescent well-being and health, yet PSCH appears to be increasing (Lindgren & Lindblad, 2010). This is an enigma.

When homing in on the Nordic countries, one country appears to stand out: Sweden. Bremberg presented a review article (2015) in which he examined time trends for young adults (ages 15 through 24) between 1990 and 2010 for Sweden, Norway, Denmark, Finland, and the Netherlands. Overall he found a slight increase in internalizing mental symptoms and decreased suicide rates. However, in Sweden there was a slight increase in suicide and a marked increase in internalizing mental health symptoms. There are no obvious explanations for the diverging trends in those five countries. To find possible causes, Bremberg analyzed different data sets to see if Sweden differed from the other four countries. He found that Sweden differed in two respects: decreased school achievement and increased unemployment rates. School achievement among 15-year-olds in Sweden decreased considerably in mathematics, reading, and science. And unemployment rates among Swedish people ages 15 through 24 saw a fivefold increase between 1990 and 2010—while the rate decreased in the majority of the other four countries.

Do increases in youth mental health problems lead to actual functional impairment? Functional impairment can be operationalized in different ways. Van Geelen & Hagquist (2016) operationalized functional impairment to cover aspects such as difficulties with most or all school courses, school absenteeism, and lack of social activity with family and peers. They then looked at a Swedish sample (n=19,800) adolescents (ages 15 and 16) between 1988 and 2008. They compared youth mental health through data on symptom prevalence and analyzed these together with data on functional impairment. They also came to the conclusion that psychosomatic problems had increased significantly during the time period and that there was a significant increase in participants with psychosomatic problems in combination with functional impairment. Homlong et al. (2015) followed a Norwegian sample of 15- to 16-year-olds between 1999 and 2010 and looked at the association between self-reported mental health problems at age 15 and later work marginalization (measured by being on long-term social welfare benefits). There was an increasing relative risk for social welfare usage, depending on how many mental health problems the individual self-reported at age 15. Another Norwegian study, by De Ridder et al. (2013), followed adolescents during the ten-year period 1997 to 2007 and investigated whether self-reported mental health problems at the start were associated with later school dropout and work marginalization (by being on long-term social welfare benefits). They concluded that there is a strong association between self-reported poor mental health at baseline and high school dropout rates and reduced work integration later in life. So both reports of adolescents' mental health problems and functional impairment are increasing, and there is an association between self-reported mental problems and risk for later adverse outcomes such as being a school dropout, reduced work integration, and lack of social activity with family and peers.

2.1.2 Why do young girls report more mental health problems compared to young boys?

In the majority of studies, girls report more mental health problems then boys do. Looking at time trends, it seems that there is no significant difference in the rate of increase in mental health problems between girls and boys (Potrebny, Wiium, & Moss-Iversen Lundegård, 2017), both are increasing at a similar rate. However, there is a higher prevalence of problems among girls (e.g., van Geelen & Hagquist, 2016; Homlong et al., 2015; Potrebny et al., 2017). And the reasons for this higher prevalence are not clear. Some possible reasons have been highlighted. According to West and Sweeting (2003), the increase of PSHC among young females might partly be explained by an increase in educational expectations; this, in combination with more traditional concerns about personal identity (including appearance and weight), appears to have elevated stress and had adverse consequences for mental health. There is a gender difference when it comes to the form and function of relationships with family and peers. Boys' relationships are often based on joint activity and companionship, whereas girls tend to rely more heavily on close friends for emotional support, and girls tend to form more intimate relationships (Rudolph, 2002). Those gender differences are accentuated during adolescence, when peers becomes the primary context for emotional experience and when socialization and gender roles become more salient. Overall, girls value harmonious relationships and being evaluated positively by others to a higher degree than boys do. This is helpful in that girls report having more intimate relationships, and it also

makes girls more vulnerable to stress or conflict within relationships, as this threatens girls' emotional well-being more than it does for boys. There is also an interplay between subjective and physiological stress responses to interpersonal stressors (Rudolph, Flynn, Abaied, Groot, & Thompson, 2009). One study (Owens et al., 2018) measured affective and HPA-axis reactivity (by measuring diurnal cortisol secretion and the cortisol awakening response) when boys or girls were stressed during an experiment. Adolescent girls had elevated affective and HPA-axis reactivity to interpersonal stress, which suggests that the negative effects of interpersonal stress are more exacerbated for girls. They also found that girls with elevated HPA-axis reactivity longitudinally had elevated levels of depressive symptoms.

It has also been noted that research has identified an earlier onset of puberty compared to previous generations, and early puberty in girls may increase the risk of depression (Galvao et al., 2014). Earlier sexualization among girls has been associated with depressed mood and poor self-esteem (Hatch, 2011; Galvao et al., 2014). Another suggested reason for the increase of PSHC among girls is that societal changes such as high electronic media use and media and consumer culture are presumed to negatively affect girls more than boys (Potrebny et al., 2017). It is also possible that all those factors contribute to the increased internalizing problems in adolescent girls.

Focusing on Sweden, the burden of mental health problems can be measured in many ways. Common ways are to look at (a) self-reported mental health from youth themselves, (b) statistics for youth diagnosed with a psychiatric condition, or (c) statistics for youth on medication for psychiatric conditions.

For investigating mental health problems among youth via self-reports, researchers are advised to also include somatic health complaints (e.g., headache, backache, stomachache, and dizziness), since the combination of mental and somatic complaints often are considered to be a unidimensional factor (Dey et al., 2015). A Swedish study shows that self-reported mental and somatic complaints doubled among Swedish 15-year-olds from 1985 to 2014 (Folkhälsomyndigheten, 2014). Girls reporting at least two psychosomatic symptoms more then once a week over the preceding six-month period increased from 29% in 1985 to 57% in 2014. Among boys, the increase was from 15% in 1985 to 31% in 2014. Is it "only" self-reported mental and somatic complaints that have increased in Sweden?

2.1.3 Self-reported health, psychiatric diagnoses, medicalization for diagnoses, and functional impairment

In Sweden, there has also been an increase among the general adolescent population in terms of psychiatric diagnoses, medicalization for psychiatric diagnoses, and use of mental health services during the period 2006 through 2016. There is national data from the Socialstyrelsen patient registry (Socialstyrelsens patientregister, 2017) with numbers for ICD-10 diagnoses (WHO, 1992) among children and youth who have been hospitalized for mental health problems or have gotten a diagnosis in outpatient care. Given that a majority of youth with mental health problems will not seek treatment (Bremberg & Dalman, 2015), this is not a good source for measuring the prevalence of severe psychiatric problems, but it can give an indication about possible increases of diagnoses. Among the age group from infancy to 17 years, the number of diagnoses doubled between 2006 and 2016 (from 1.5% to 3% for girls and 1% to 2% for boys). Those numbers are for psychiatric diagnoses but excluding neuropsychiatric diagnoses (e.g., autism and ADHD). The increase in psychiatric diagnoses

(neuropsychiatric diagnoses excluded) are mainly driven by increases in diagnoses for depression and anxiety. There are also increases in drug-use disorders, especially among young men. Prescriptions of medication for mental health problems have increased in parallel with the numbers of psychiatric diagnoses (Socialstyrelsen, 2017). Stockholm County has registers that also cover visits with personnel other than medical doctors (as is the case for the Socialstyrelsen patient registry) and visits for both inpatient and outpatient care. The increases in use of mental health services in Stockholm county also almost doubled between 2002 and 2013. In 2013, 10% of youth ages 13 through 17 sought child and youth psychiatry services (Bremberg & Dalman, 2015, p. 43).

It has been suggested that increases in self-reported mental health complaints among Swedish youth can be partly explained by youth's more openly discussing mental health. However, given that the increases of self-reported mental health problems also are reflected in an increase among the general adolescent population in terms of psychiatric diagnoses, medicalization for psychiatric diagnoses, and use of mental health services, this indicates a factual increase of mental health problems among youth (Socialstyrelsen, 2017). Apart from the two factors—decreased school achievement and increased unemployment rates in Sweden—the causes of the increases are unknown. Since increases in mental health problems can be found in the total sample of Swedish youth, the causes can probably be found among factors that affect living conditions for youth at large (Socialstyrelsen, 2017).

To sum up, internationally self-reported mental health complaints increased during the period 1950 through 2000 (Rutter & Smith, 1994; Twenge et al., 2010; Xin et al., 2012), then became more stable in 2000 through 2010 (Potrebny, Wiium, & Moss-Iversen Lundegård, 2017; Bor et al., 2014; Bremberg, 2015). Northern Europe was the only subregion with a clearly significant minor increasing trend in adolescent self-reported mental health complaints between 1982 and 2013 (Potrebny, 2017). When comparing the Nordic countries, Sweden stands out, with a slight increase in suicide and a marked increase in internalizing mental health symptoms (Bremberg, 2015). And the increases in Sweden regarding youth self-reports are accompanied by increases in terms of psychiatric diagnoses, medicalization for psychiatric diagnoses, and use of mental health services during the period 2006 through 2016.

There are also reports of increasing functional impairment among adolescents, and associations between self-reported mental health problems and risk for later adverse outcomes such as school dropouts, reduced work integration, and lack of social activity with family and peers (van Geelen & Hagquist, 2016; Homlong et al., 2015; De Ridder et al., 2013).

Given that individual studies trying to map time trends regarding increases or decreases in mental health problems over time have come to somewhat differing conclusions, there are some debates academically and publically about whether mental health problems are increasing or not. While it is good and welcome to see time trends, since they provide an important context surrounding mental health problems, I also see a risk that policy makers who get a message that mental health problems are *not* increasing could come to a false conclusion that youth mental health problems are not a pressing public health concern. Such a conclusion would miss the important fact that huge numbers of youth actually are suffering at the moment, and they are at risk for a series of potential problems as they age if they do not get adequate help. Just as an example, in Sweden 51% of 15-year-old girls and 31% of 15-

year-old boys are reporting having mental and somatic complaints over the preceding six months. Therefore I agree with concluding remarks of Potrebny et al. (2017) about increasing mental health problems between 1982 and 2013: "This is likely to influence adolescent health, functioning and well-being, while the growing evidence of a trend of increasing burdens in the context of adolescent mental health is rightfully a public health concern, as stated by earlier research" (p. 19). And preventive measures need to be taken on an individual as well as a societal level.

2.1.4 Why have increases in the provision of treatment (antidepressants in particular) not decreased mental health problems?

What can be done to decrease the population-level burden of mental health problems among youth? In Sweden we have more and more youth who seek and use mental health services, and more adolescents who get psychiatric diagnoses and medicalization for psychiatric diagnoses, yet there still seems to be no decrease in mental health problems. On the contrary: Socialstyrelsen predicts an increase of psychiatric diagnoses among children and youth.

We know that many people with mental health problems do not receive treatment. An estimated 36% to 50% of even the most serious cases remain untreated each year. This has been referred to as the *treatment gap* (Demyttenaere et al., 2004). And to bridge this gap, the 2001 World Health Report made recommendations to address this (Kohn, Saxena, Levav, & Saraceno, 2004). The recommendations included making mental health treatments more accessible (via primary care), training of mental health professionals, and making psychotropic drugs more available. Efforts to bridge the treatment gap has been orchestrated in several countries over several years. To evaluate what effects those efforts have had, Jorm et al. (2017) analyzed data from four high-income countries (England, the United States, Canada, and Australia) between 1990 and 2015. Results showed that since 1990 there had been substantial increases in the provision of treatment (antidepressants in particular). Yet despite these changes, there was no evidence for decreased prevalence of disorders or symptoms in any of the countries over the period. On the contrary, there were indications of an increased prevalence of disorders in three out of four countries. There are several hypotheses for the lack of improvement; two popular ones posit that actual improvements have been masked by public awareness and increased reporting of symptoms, or that there has been an increase in other risk factors during this period. Researchers examined whether those two factors had masked improvements and found no support for that hypothesis for either of them. According to the authors (Jorm et al., 2017), two more plausible explanations for the lack of improvement despite increased provision of treatment are (a) low quality of treatments, as —many treatments that were offered did not fulfill even minimum standards suggested by clinical practice guidelines, or were not targeted optimally; and (b) lack of prevention—that is, limited efforts to prevent common mental health disorders.

An unresolved challenge that remains for health systems globally is to reduce the prevalence of common mental disorders. This may require us to rethink our models for mental health problems, and in addition to bridging the treatment gap we may also need to pay greater attention to the *prevention gap* and the *quality gap*.

Personally, I see a risk in simply "scaling up" existing systems for provision of treatments for mental health problems. I believe that, to some extent, we need to rethink our models of

mental health problems, and give high-quality interventions at all levels (e.g., primary prevention at the population level, early interventions for people with subthreshold symptoms). An interesting and promising model for understanding and treating mental health problems has been suggested by the Lancet Commission on Global Mental Health and Sustainable Development (Patel et al., 2018).

2.2 A MODEL FOR UNDERSTANDING AND TREATING MENTAL HEALTH PROBLEMS

Perhaps the most common way to describe and classify mental health disorders is by categorizing them as discrete disorders, similarly to how physical illnesses are categorized. Two common classification systems are the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) (American Psychiatric Association, 2013) and the International Classification of Disease (ICD) (WHO, 1992). There are advantages and disadvantages to using such classification systems, which to a great extent use a categorical or binary approach (presence or absence of a mental health disorder). One advantage of categorical terminology like a diagnosis is that it is relatively easy for clinicians and policy makers to understand and to apply it. Clearly defined disorders can be helpful when deciding what treatment could be effective for a person with a given diagnosis. A clear definition is helpful, when doing research, to make sure the population of a study are affected by the disorder; if so, study results usually can be generalized to other populations with the given disorder. Clearly defined disorders are also of importance to being able to collect data on the prevalence of disorders and compare among populations and nations.

However, there may also be disadvantages with categorical terminology like diagnoses. One is referred to as the "reification problem" (Kendler, 2014). A diagnoses is not a "real thing"; it is a label that can be assigned when we see similar sets of signs or symptoms to such an extent that it fulfills the criteria for a diagnosis. And many of those symptoms and signs were selected based on clinical experience of which signs are the most useful diagnostic indicators, rather than on choices made through careful scientific evaluation. Problems might arise when mental health professionals or affected persons act as if DSM criteria *constitute* a disorder—when it becomes an entity in and of itself (reification). When I take the perspective of a client's best interests, it is important to me to find out what the function is being labeled with a diagnosis; is it helpful for the client or not? Sometimes a diagnosis is useful in the sense that it can help an affected youth to get adequate help from mental health professionals and the school; it might be a relief to know that this suffering has a name and offers recognition and validation of patterns of behavior ("It's not my fault that I misbehave") and they are not alone in their suffering. And sometimes a diagnosis is not so helpful, as it can diminish the agency of the affected person. If an affected person believes that there is not much he or she can do differently because he or she has a diagnosis ("It's not my fault that I misbehave; it's because I have ADHD") or believes he or she is "broken" or "different," the diagnosis might not be so helpful.

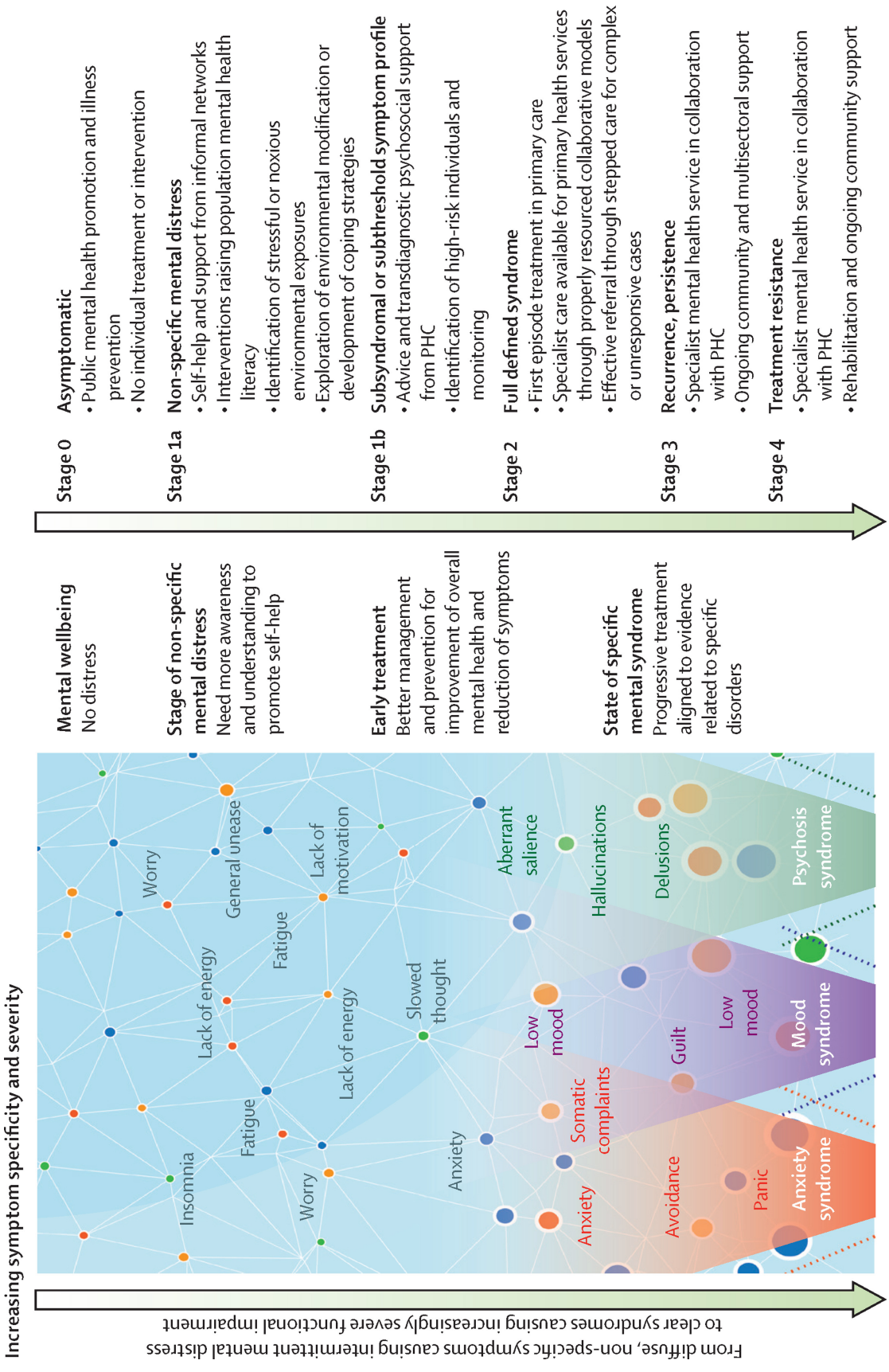
Acting as if DSM criteria *constitute* a disorder can be problematic from the perspective of mental health professionals if this promotes a reductionist perspective that oversimplifies and undervalues the complexities of personal circumstances. And it can be a problem if we equate *not* having a diagnosis with not needing an intervention or help. This might lead us to overlook the importance of acting early on as mental health professionals. It is better to act before a person's functioning has declined to such an extent that the person fulfills criteria for

a diagnosis—and at that stage probably has a worse prognosis for time to recovery. Admittedly, classification systems have clinical utility and should not be abandoned; however, such systems also would benefit from taking into account that mental health and mental health problems can be classified on a continuum and there are opportunities for intervention at all stages of a disorder. Therefore the Lancet Commission on Global Mental Health and sustainable development (Patel et al., 2018) suggests what they call "a staging approach to the classification and treatment of mental disorders" (p.1565) (see Figure 1).

Mental health problems exist along a continuum ranging from mental health as a state of well-being to chronic, severely disabling conditions. The starting point at the positive end of the continuum is mental health; one of the most cited definitions is by the World Health Organization (2018): "Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community." WHO also highlights that mental health "is more than just the absence of mental disorders or disabilities." As defined here, well-being is a positive construct that includes two related ideas: subjective satisfaction with life, and human development and meaningful functioning. Therefore there is not an either-or relationship between mental health and mental health problems. A person could have distress, disability, and symptoms of a mental health disorder and also have a degree of mental health if the person is achieving her or his potential and satisfied with life according to the person's expectations.

Figure 1 suggests that there are two stages between mental health (stage 1a, nonspecific mental distress, and stage 1b, subthreshold symptom profile) and a full defined syndrome (stage 2) for which DSM or ICD diagnoses normally would be given. And in those two stages people tend to present with more mixed and less severe symptoms compared with those in mental health services. A nationwide study by Das-Munshi, Goldberg, and Bebbington (2008) suggests that mixed presentations may be the norm in the population at large, and that common symptoms of mental distress are associated with more total disability then diagnostically defined mental disorders at the population level. They argue that this group must be identified on their own merits and be given help at an appropriate level. However, they do not suggest an expansion of the boundaries of what is considered to be a mental disorder, as this would risk the medicalization of normal human distress. Instead, they suggest including a dimensional perspective, such as the staging perspective described in Figure 1.

Figure 1. Patel et al. (2018) staging model. Reprinted with permission.



Our current diagnostic system has a focus on well-established and largely chronic illnesses; we do not capture early stages of a disorder when preventive efforts or early interventions have the potential to offer the greatest benefit. The staging approach described in Figure 1 offers a more balanced view, whereby an equal emphasis is placed on promotion of mental health and prevention of mental disorders (particularly interventions early in life) on the one hand, and on the other hand treatment, rehabilitation, care, and recovery. Acknowledging clear stages over the whole continuum, from mental health to chronic, severely disabling conditions, also recognizes the potential benefits of intervention at each stage.

2.3 HOW CAN WE TREAT MENTAL HEALTH PROBLEMS AMONG YOUTH?

The Lancet Commission on Global Mental Health and Sustainable Development (Patel et al., 2018) concludes: "Despite substantial research advances showing what can be done to prevent and treat mental disorders and to promote mental health, translation into real-world effects has been painfully slow" (p.1553). Here are some of their overarching suggestions regarding helping youth:

- *Mental health services needs to scaled up and integrated outside formal care settings*

It is known that many youth with mental health problems do not receive treatment; this was mentioned earlier as the treatment gap. And youth are particularly likely to avoid formal care settings. Therefore we need new, innovative ways of reaching them in other settings, such as school settings. There is also a need to integrate mental health care across a range of platforms, notably in education, primary care and child health care, child protection, and social care settings.

- *Use evidence-based interventions across mental health services*

While scaling up is important, it is also important that we scale up sound and safe interventions that evidence shows have great potential to be effective. Studies have suggested that much of the treatment currently provided is not in line with clinical practice guidelines; rather, it is of lower quality. This is the aforementioned quality gap.

- *Scale up mental health services by training nonspecialists*

To make evidence-based interventions available on a broad scale, it's recommended that we transfer some of the mental health care responsibilities from highly specialized staff to less-specialized staff. Systematic reviews have shown that interventions for treating mental disorders in children can be effective even when delivered by nonspecialists (e.g., Purgato et al., 2018).

- *Scale up mental health services by embracing technical solutions*

There are several ways in which technical solutions can be used to scale up interventions. One is to use digital technology to effectively train nonspecialist health care workers through digital learning platforms. Such platforms can also be used for supervision; they can contain decision support tools and give easy access to specialist consultation and support. Other ways are to use apps or websites to educate the public about mental health issues; digital tools can

be used for screening, early self-help without support, and at later stages online psychotherapy with support (Andersson, Titov, Dear, Rozental, & Carlbring, in press).

- *Involve youth and offer choices of stepped care*

Youth should be actively involved in the design and delivery of services. They should also be offered choices between low-intensity interventions, such as digitally delivered guided self-care, and high-intensity interventions, such as face-to-face interventions delivered in youth centers or primary care facilities.

- *Protect mental health through public policies*

Each country needs to protect mental health through its public policies. And leaders need to engage a wide range of stakeholders, such as sectors in education, child and youth services, workplaces, social welfare, gender empowerment, and criminal justice.

- *More investments are needed to stimulate actions to address mental health and mental health problems.*

There is an urgent need for substantial additional investments to scale up interventions at the societal level and individual level. Here I will provide more concrete examples of interventions that could be prioritized.

Different stages of mental health or mental health problems require different solutions to be of maximum benefit. It is important to intervene early, before suffering escalates. Typically, there is a lengthy precursory phase before the diagnosis of a mental disorder. In early stages, the symptoms of a mental disorder are easier to influence. Early intervention to help those who have not yet received a diagnosis could reduce the incidence and onset of mental disorders as well as shorten episodes of illness and increase participation and quality of life.

Following the arrows downward in Figure 1 illustrates how mental disorders become more clearly divided into syndromes (anxiety, mood, and psychosis syndrome) as more severe mental disorders develop. Most clinical and epidemiological research and resources have been allocated to the later stages, when a diagnosis of a mental disorder has been established. Because of this we generally have more knowledge about which specific clinical interventions are beneficial at those later stages. Therefore I will provide mainly examples of interventions at the earlier stages where we can intervene.

2.3.1.1 Stage 0. Interventions for asymptomatic youth

Life presents challenges for all of us. And there is much we can do at the population level to promote good mental health and prevent mental problems. There are excellent opportunities to make improvements on both a societal level and the individual level. Speaking personally, I often notice a dichotomization here from researchers, clinicians, and policymakers. One camp argues forcefully that mental health problems are caused by societal dysfunction and inequalities, so it is in the hands of policy makers and politicians to make societal changes in order to curb problems. The other camp argues that the way to help is by training individuals in how to deal with life's challenges, and by offering psychotherapy after mental disorders

have developed. As a contextual psychologist I find it pretty obvious that we need to work to intervene simultaneously at the societal level and the individual level.

Interventions at the societal level

- Interventions to reduce poverty and socioeconomic gaps

- Interventions to reduce violence in society

- Community interventions to increase opportunities for employment/occupation and social inclusion

- Interventions to make schools safe and effective and reduce school stress

- Interventions to reduce bullying

- Taxes on alcoholic beverages and restrictions of their marketing and availability

- Full geographic coverage and easy access to mental health care

- Early childhood interventions to provide and ensure stable and nurturing environments for children

Interventions at the level of individuals

There is an overlap between interventions at a societal level and interventions at the individual level insofar as implementing programs for suicide prevention at the national level (as one example) also directly affects individuals. Population-level interventions require less targeting, since they also can benefit youth with and without clinically significant symptoms. Here are some examples:

- Suicide prevention in schools

Worldwide, the second leading cause of death for young people is suicide (Wassermann et al., 2015). One universal suicide preventive intervention in schools that has been successful is the Youth Aware of Mental Health (YAM) program. In a multicenter study spanning 10 European countries and 11,110 pupils, this intervention reduced severe suicidal ideation and the number of suicide attempts in school-based adolescents (Wassermann et al., 2015).

- Universal programs to promote mental health that has broad impact on mental health problems

A good example of such a program is the Good Behavior Game (GBG), a universal classroom behavior management method. It was first tested in classrooms with pupils ages six to eight. A long-term follow-up (Kellam et al., 2011) when the children had reached ages 19 to 21 found significantly lower rates of regular smoking, drug and alcohol use disorders, suicide ideation, delinquency and incarceration for violent crimes, antisocial personality disorder, and use of school-based services among students who had played the GBG compared to a control group.

- Universal programs to build resilience among youth

Universal social and emotional learning (SEL) interventions in schools and communities can promote children's social and emotional functioning; reduce risky behaviors including smoking, teenage pregnancy, and bullying; and improve academic performance. To maximize effects of such programs, the most effective interventions take a whole-school approach (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Sklad, Diekstra, De Ritter, & Ben, 2012; Wells, Barlow, & Stewart‐Brown, 2003; Shackleton et al., 2016). A recent example of an ACT intervention is by a Finnish team of researchers (Puolakanaho, et al., 2018) who found a short web- and mobile-delivered five-week ACT intervention program to be effective in reducing stress and improving academic performance among 15-year-olds in school.

- Resources to help youth avoid academic failure or school dropout

Given that poor school performance increases the risk of internalizing problems and suicide among children and adolescents (Henriksson et al., 2018; Patel, Flisher, Hetrick, & McGorry, 2007) and being a school dropout increases the risk of further, more severe mental health problems and work marginalization (Homlong et al., 2015), it is important to identify and support youth who are at risk.

2.3.1.2 Stage 1a. Interventions for nonspecific mental distress among youth

Interventions on a societal level

- Identify sources of stress in the environments of youth and remove the stressors or minimize the negative impact they may have.

Interventions on the level of individuals

- Provide evidence-based self-help resources that are easily accessible for youth.

2.3.1.3 Stage 1b. Interventions for subsyndromal or subthreshold symptom profile

Interventions on a societal level

Improve accessibility and quality of youth mental health care.

Interventions on the level of individuals

- Provide screening of youth in schools and offer brief transdiagnostic interventions based on CBT. An example of such an approach to remedy depressive symptoms, stress, and anxiety is Paper I, described in this thesis (Livheim et al., 2015).

- Provide screening for alcohol and substance use and offer brief interventions based on CBT elements, motivational interviewing, or family support (Valero de Vicente, Ballester Brage, Orte Socías, & Amer Fernández, 2017).

- Deliver advice and transdiagnostic psychosocial support via primary health care or stand-alone youth-friendly centers.

- Limit use of antidepressants for mild to moderate depression among youth. The national guidelines in Sweden, issued by the National Board of Health and Welfare (Socialstyrelsen, 2004), suggests psychological treatments, such as CBT, as the initial treatment for mild to moderate depression among children and youth. Psychological treatments also have been shown to produce greater, more enduring effects compared to pharmacological therapies (Cuijpers et al., 2013).

Stage 2. Interventions for full defined syndrome among youth

Stage 3. Interventions for recurrent, persistent problems among youth

Stage 4. Interventions for treatment-resistant recurrent, problems among youth

As mentioned previously, more research has been conducted into effective treatments for youth at those later stages: 2, 3, and 4. And to contextualize, the ACT intervention described in Paper III in this thesis (Livheim et al, n.d.) could be an example of an intervention that can be used on any of the stages, 1.b through Stage 4.

2.4 RISK FACTORS FOR YOUTH MENTAL HEALTH PROBLEMS

Researchers now acknowledge that there are many causes for mental health problems, and that there is a complex interplay of psychosocial, biological, environmental, genetic, and epigenetic factors across the life course. Childhood and adolescence are particularly sensitive developmental periods; it is well documented that adverse childhood experiences (ACEs) are an important risk factor. Kessler et al. (2010) examined the association between DSM–IV disorders and ACEs among 51,945 adults in 21 different countries. They found that ACEs were highly prevalent and interrelated. And the strongest predictor of disorders was found in the cluster that measures maladaptive family functioning (e.g., child abuse, parental mental illness, neglect). In their study across 21 countries they found that childhood adversities accounted for 29.8% of all DSM disorders in their sample. Studies done by using magnetic resonance imaging (MRI) indicate that ACEs induce functional and structural changes in multiple systems throughout the brain (Bick & Nelson, 2016). Neuroscientists are also starting to understand how those changes in brain development may cause cognitive and emotional difficulties.

The pathways to mental health problems are complex and bidirectional: if a person grows up in a poor household, that person has a higher risk of being exposed to ACEs and other risk factors for mental disorders, such as poor nutrition, inadequate education, violence, and a lack of social networks in the neighborhood. The resulting mental health problems contribute to educational underachievement and loss of employment.

A characteristic feature of the most common mental health problems among youth is sex differences. Young men are many times more likely to be affected by conduct or behavior disorders and schizophrenia, whereas young women are 1.5 to 3 times more likely to suffer from depressive disorders and to attempt self-harm (McGrath, 2006; Moffitt, Caspi, Rutter, & Silva, 2001). There is no firm evidence for the cause of these differences between the sexes. One hypothesis is that there might be differences in the rates of exposure to environmental and biological risk factors between the sexes, and that the interaction of those risk factors

differs between them. For example, the increased risk of behavior disorders in boys might be explained by an interaction between genetic and environmental factors (Moffitt et al., 2001). And different rates of exposure to environmental factors (i.e., gender-based violence is more common among young women) may explain the enhanced risk of self harm and depression in young women (World Health Organization, 2005).

Table 1 shows a selection of risk and protective factors for the mental health of children and adolescents. Both categories can be grouped into biological, psychological, and social factors. The table also reminds us that there *are* protective factors, and that fortunately, most young people do not suffer from mental disorders. Even the majority of youth who have multiple risk factors and face severe adversities remain in good mental health (Richter, 2006). Understanding protective factors is key to understanding how risk factors can be modified or even eliminated.

It has been suggested that the most important protective factor might be to help parents provide adequate psychosocial stimulation during early childhood, because youth's responses to difficult situations are shaped by early life experiences (Bartley, 2006). Other factors that protect against development of behavioral or emotional disorders are factors such as a sense of connection, and an environment that encourages the expression of emotions and has low levels of conflict (McGee et al., 1990; Bartley, 2006). Social support might be an important psychosocial buffer even when other risk factors are present (Birmaher, Ryan, & Williamson, 1996 .

Table 1

Selected Risk and Protective Factors for Mental Health of Children and Adolescents, by Domain

	Risk factors	Protective factors
Biological		
	Exposure to toxins (eg, tobacco, alcohol) in pregnancy Genetic tendency to psychiatric disorder Head trauma Hypoxia at birth and other birth complications HIV infection Malnutrition Substance abuse Other illnesses	Age-appropriate physical development Good physical health Good intellectual functioning
Psychological		
	Learning disorders Maladaptive personality traits Sexual, physical, emotional abuse and neglect Difficult temperament	Ability to learn from experiences Good self-esteem High level of problem-solving ability Social skills
Social		
Family	Inconsistent care-giving Family conflict Poor family discipline Poor family management Death of a family member	Family attachment Opportunities for positive involvement in family Rewards for involvement in family
School	Academic failure Failure of schools to provide appropriate environment to support attendance and learning Inadequate or inappropriate provision of education Bullying	Opportunities for involvement in school life Positive reinforcement from academic achievement Identity with school or need for educational attainment
Community	Transitions (eg, urbanisation) Community disorganisation Discrimination and marginalisation Exposure to violence	Connectedness to community Opportunities for leisure Positive cultural experiences Positive role models Rewards for community involvement Connection with community organisations

Note: From "Mental Health of Young People: A Global Public-Health Challenge," by V. Patel, A. J. Flisher, S. Hetrick, & P. McGorry, 2007, *Lancet*, *369*, 1302–13. Reprinted with permission.

Mental disorders have varying overlaps regarding genetic heritability, but there is also remarkable variation between individuals. In conditions such as intellectual disability and autism spectrum disorder, it is common to find a few genetic variations that have a significant effect, whereas in conditions such as anxiety disorders, depression, and schizophrenia, the

associated genetic variations are often multiple genetic variations that all have only a minor contributing effect (Sullivan, Daly, & O'Donovan, 2012; Breen et al., 2016).

Another area of genetic research is around gene expression (e.g., genes can be turned on or off). There are findings that environmental risk factors could affect mental health by influencing gene expression. It has been shown in animal models that negative epigenetic processes might be reversible (Ponchel & Burska, 2016). This could have an impact on the design of new intervention strategies.

Another area of research is around neuroinflammation. It has been shown that risk factors such as ACEs could raise the concentration of inflammatory cytokines and affect psychological functioning negatively (Slavich & Irwin, 2014).

Considering all of this data, an individual's mental health is the unique product of environmental and social and influences (especially early in life), and there are interactions among genetic, epigenetic, neurodevelopmental, and psychological processes that affect biological pathways in the brain. These in turn influence an individual's behaviors, and those behaviors can improve or degrade an individual's mental health (Patel et al., 2018).

Taking into account that childhood and adolescence are developmentally sensitive periods (high brain plasticity, rapid brain development, a common time for the onset of mental health problems), it is important that we be prepared to undertake interventions for children and youth that promote mental health and prevent mental health problems (Patel et al., 2018).

Stress affects all of us, and stress is a factor in most mental health and somatic disorders. The transdiagnostic character of stress makes it a unique target for prevention of mental health problems; therefore stress was chosen as the primary outcome in Paper I in this thesis (Livheim et al., 2015). Depression is also a common and recurring problem among youth, so it was chosen as primary outcome in both Paper I (Livheim et al., 2015) and Paper III (Livheim et al., n.d.) in this thesis. Accordingly, the following sections will cover stress and depression in greater depth, touching on questions like these: What are stress and depression? How common are they? And what interventions can be effective in alleviating problems that stems from stress or depressive symptoms?

2.5 STRESS

2.5.1 Stress: What is it?

Stress is very well known for its effects on mental health. Physiological stress is an organism's response to a stressor. Stress is the body's protective method of reacting to something that could be dangerous (such as a threatening person) or something challenging (such as a pressing deadline), this reaction is commonly called the fight-or-flight response. The stress reaction activates multiple body systems; the two systems most involved in responding to stress are the autonomic nervous system (ANS), and the hypothalamic-pituitary-adrenal (HPA) axis (Ulrich-Lai & Herman, 2009). *Stress* is a general term for the process in which environmental demands or events exceed the resources of an individual and endanger their well-being (Folkman, Lazarus, Gruen, & DeLongis, 1986). Stress is abundant in everyday life; we respond by producing a range of psychological and physiological

changes originating in the brain. Dysfunctional stress responses to frequent or chronic stress exposure can be detrimental to our mental as well as physical health (Lovallo, 2016) .

It has become clear that when the brain is still developing in critical early periods of life, stress can have profound implications for short-term school performance and, perhaps more alarmingly, have effects that last for a lifetime (McEwen, 2015; Sonuga-Barke et al., 2017). Both psychological and physical problems may lead to school absence or truancy, causing a negative cascade of problems. In the long term, especially if stress is frequent or chronic, it can impact growth and brain development as well as emotional and cognitive development. This further increases the risk of developing more severe mental disorders, such as behavioral or conduct problems, anxiety, and depression (Shonkoff , Boyce, & McEwen, 2009; Vanaelst et al., 2012).

The age period between 13 and 16 is the pubertal phase, in which we typically see an increase in stress reactivity and sensitivity to social stressors (Larson & Asmussen, 1991; Spear, 2009). Peer factors become highly salient, and not fitting in with the peer group is predictive of mental health problems than can last for a long time (Angold & Rutter, 1992; Copeland, Shanahan, Costello, & Angold, 2009). Many transitions in this period require adaptation and flexibility of youth: major bodily and hormonal alterations, finding one's own identity, fitting in with peers, becoming more independent of parents, and getting used to a new educational setting with more homework and less free time. Besides these changes, the pubertal brain undergoes rapid developments, with development of prefrontal control and a brain network that lags behind the many emotional and cognitive changes that adolescents experience. The heightened tendency for emotional impulses, particularly in the presence of peers—under so-called "hot" conditions—is related to more risk-taking behavior in this age group than in any other. In fact, adolescence is a very sensitive period for youth at risk for developmental psychopathology, as this is the typical time period for the onset of several psychiatric disorders.

When youth themselves report what they are stressed about they report stress from being rejected by other children, being bullied, not having friends, difficulties making friends, actual or perceived discrimination by teachers, losing games, or dealing with racism, not performing well enough in school or sports, moving schools, and too much homework.

It is important to distinguish between short-term stress (also called *acute stress*) and long-term stress. Short-term stress can help us become more alert and focused; it can help us avoid a threat or overcome a challenge. The problem is that, without recovery, short-term stress can turn into long-term chronic stress, which can in turn lead to negative and serious psychological and physical symptoms (Livheim, Bond, Ek, & Hedensjo, 2018; Savic, Perski, & Osika, 2017; Hains et al., 2009; Arnsten, 2009).

2.5.2 Risk factors for stress

The risk and protective factors presented in Table 1 are also applicable when it comes to stress; another important factor to weigh is interpersonal stressors. As a species we have evolved to live and cooperate in groups. Throughout history, cooperative people have outcompeted those groups with selfish individuals (Biglan, 2015). Humans have evolved levels of cooperation that are not seen in any other primate. You might say we are evolutionarily designed to be a flock species. In relation to stress, this manifests in such a way that strong social relationships are a buffer against stress-related problems. Interpersonal conflicts (especially with people whom we are close to) produce high levels of stress. And we are constantly comparing ourselves with other members of the group. *Am I fitting in? Am I contributing enough? Am I following the rules and norms of my group?* A negative answer could mean we are at risk of being rejected by the group. And rejection from the group has historically (at least up to some hundred years ago) drastically lowered our chances of survival. Therefore interpersonal stressors can trigger our primitive stress (Cacioppo, Cacioppo, Capitanio, & Cole,2015; Davidson & McEwen, 2012; Eisenberger& Cole, 2013). Having weaker social relationships makes us more vulnerable to stress-related problems. In fact, having weaker social relationships has even been shown to increase mortality over time by 50%; as a risk factor it is comparable with smoking 15 cigarettes a day over time (Holt-Lunstad, Smith, & Layton 2010). Adolescence is also a time when a person orients away from the family he or she grew up in (the first flock), a time to orient toward becoming independent, fit in with peers, form romantic relationships, explore sexuality, and choose a career. This also makes adolescents especially susceptible to interpersonal stressors. This sensitivity may be especially marked in girls, who, again, tend to rely more heavily on close friends for emotional support and to form more intimate relationships (Owens et al., 2018; Rudolph, 2002; Rudolph et al., 2009).

Sleep disturbances are a factor that commonly co-occurs with stress-related problems. And they typically interact with each other in a diabolical way. Being stressed increases the risk of going to bed late and can make it more difficult to fall asleep. And not sleeping enough as a child or adolescent is associated with adverse consequences for mental and somatic health, both directly and over time (Norell-Clarke & Hagquist, 2017; Davies et al., 2014).

It's worth highlighting another risk factor for stress: ACEs induce functional and structural changes in the brain that can make the affected person more vulnerable to stressors throughout life (Bick & Nelson, 2016).

Another risk factor, not mentioned in Table 1, is belonging to a minority group, which also can increase stress; this is sometimes referred to as *minority stress*. Members of stigmatized groups are at heightened risk for chronically high levels of stress. Numerous studies show how minority individuals experience high levels of prejudice, which trigger stress responses (e.g., anxiety, high blood pressure) that accrue over time and eventually lead to poor mental and physical health (Brännström & Pachankis, 2018; Meyer, 2003). An example from Sweden is the situation for lesbian, gay, bisexual, and transgender (LGBT) youth. A survey

covering Swedish LGBT youth ages 13 through 25 showed that they had poorer general health and more frequently impaired functioning compared to heterosexual youth. Other stress-related symptoms more common among LGBT youth are sleep disabilities, gastrointestinal disorders, headaches, and migraines. Examples of stressors commonly encountered by LGBT youth include exposure to discrimination, risking being rejected because of one's gender identity or sexual identity, social isolation, and violence (FORTE, 2018).

Stress among youth is common. There is a connection between mental health problems and feeling stressed by demands from school. In Sweden 61% of 15-year-old girls and 35% of 15-year-old boys report that they are fairly stressed or very stressed by school demands (Folkhälsomyndigheten, 2018).

As discussed earlier in this thesis, more girls than boys report poor mental health complaints. This is also true for stress. For a lengthier discussion on the possible causes of those gender differences, see 2.1.2, Why do young girls report more mental health problems compared to young boys? in this thesis.

2.5.3 Treatments for stress among youth

Meta-analysis and systematic reviews have been conducted to investigate what kind of stress management interventions (SMI) are available and can reduce stress in adolescence (e.g., Rew, Johnson, & Young, 2014; Regehr, Glancy, & Pitts, 2013; Durlak et al., 2011; Vo & Park, 2008). Overall, the results are promising; most studies show positive results when it comes to reducing self-reported or physiological measures of stress. A logical place to target adolescents are schools, and most interventions do occur in schools; however, it is also important to include high-risk youth who might have dropped out or are homeless or incarcerated. There are methodological limitations on the research into effective SMIs for youth; for example, there are still few studies as compared to research done on SMIs for adults, many studies have small sample sizes, and there is a great variety of different operational definitions of stress and use of outcome measures. And few studies have explored the mechanisms that produce positive results.

There is a wide variety of SMIs. To give an overview, I have chosen to sort a few examples into five intervention categories: (a) those focused on a contextual level, (b) those based on mindfulness, (c) those with a focus on relaxation, (d) physical exercise to reduce stress, and (e) interventions based on social and emotional learning (SEL).

2.5.3.1 Interventions on a contextual level

As discussed earlier (in 2.3.1.1, Stage 0: Interventions for asymptomatic youth), I am an advocate for intervening at the societal level *and* the individual level simultaneously, so most of the areas I mentioned there are relevant for reducing stress among youth. The overarching idea is that we need to work toward providing safe and nurturing contexts for youth—

contexts that promote mental health and identify contextual stressors to diminish their impact. I see the following as especially relevant in the context of stress:

- Interventions to make schools safe and effective and reduce school stress

- Interventions to reduce bullying

- Community interventions to increase opportunities for employment/occupation and social inclusion

- Interventions to reduce violence and child maltreatment in society

- Interventions to reduce poverty and socioeconomic gaps

- Early childhood interventions to provide stable, nurturing environments for children

2.5.3.2 Mindfulness as stress management intervention

Mindfulness is commonly used as a stress management intervention. Mindfulness interventions have been formulated and implemented in different forms by different teams of researchers. One of the most frequent forms is mindfulness-based stress reduction (MBSR) (Kabat-Zinn & Hanh, 2009). MBSR is usually given as an eight-session intervention and has been adapted for adolescents. Adaptations include emphasizing the unique challenges of adolescence, particularly performance and interpersonal challenges, and shortening the length of sessions. Black, Milam, & Sussman (2009) conducted a systematic review of treatment efficacy for sitting meditation interventions for adolescents, and found that median effect sizes for physiologic outcomes of stress (e.g., heart rate) ranged from d =0.16 to 0.29. Apart from stress, they also found effects of reduced anxiety, ranging from d =0.27 to 0.70. Overall, these effect sizes were slightly smaller than what has been found in adult samples (e.g., Grossman, Niemann, Schmidt, & Walach, 2004).

A meta-analysis of mindfulness interventions with youth was conducted by Zoogman, Goldberg, Hoyt, and Miller (2015). They included 20 randomized controlled studies. Although they did not specifically look at reduced stress as an outcome, they found a universal, nonspecific effect size for mindfulness outperforming active control conditions. They also found that effect sizes were greater in clinical samples compared to nonclinical samples. Their conclusion is that mindfulness interventions for youth can be safely used to address a wide array of social and emotional targets in youth, and that mindfulness can be integrated into a broad range of settings, including schools, community programs, and youth programs.

2.5.3.3 Interventions with a focus on relaxation (mind-body practices)

As mentioned, physiological stress is an organism's response to a stressor that usually activates a fight-or-flight response, with activation of the HPA axis and the ANS (Ulrich-Lai & Herman, 2009). Long periods of physiological stress-activation lead to negative and serious psychological and physical symptoms. Therefore, winding down from a stress

response and recovering are considered important skills to learn (Livheim et al., 2018). The opposite of the stress response is the relaxation response (RR), characterized by increased exhaled nitric oxide, decreased oxygen consumption, and reduced psychological distress (Dusek et al., 2008). A class of interventions that elicit the RR are called *mind-body practices* (e.g., yoga, guided imagery, progressive muscle relaxation).

An example of a mind-body study (Jellesma & Cornelis, 2012) is a study of the effects of a "Mind Magic Program" conducted on youth and children. The program was delivered in the gymnastics room of the children's schools and included five weekly sessions, each about 50 minutes. The sessions contained elements such as yoga postures, visualization-based relaxation, breathing practices, and exercises that the children performed together with the aim of building trust, support, and practice in communication with and complimenting each other. Compared to the control group, participants that attended the Mind Magic Program reported statistically significant decreases in stress.

2.5.3.4 Physical exercise to reduce stress

Evidence that shows beneficial effects of regular exercise is accumulating. Regular physical activity has the potential to reduce or prevent the deleterious psychological, physiologic, and metabolic effects caused by chronic stress (Tsatsoulis & Fountoulakis, 2006). Regular physical activity reduces the risk substantially for some, but not all mental disorders. The degree of comorbid mental disorders also seems to be reduced by regular exercise (Strohle et al., 2007). The mechanisms and pathways underlying these associations are complex and not yet fully understood.

2.5.3.5 Interventions based on social and emotional learning

Social and emotional learning (SEL) is the process of acquiring and applying skills to manage emotions, decision making, and relationships. Research reviews have appeared documenting several beneficial results of SEL programs (Durlak et al., 2011; Sklad et al., 2012). A meta-analysis by Durlak, Weissberg, Dymnicki, Taylor, and Schellinger (2011) covered 213 school-based, universal SEL programs and included 270,000 students from kindergarten through high school. Compared to control groups, SEL participants demonstrated significantly decreased stress (emotional distress). Compared to controls, SEL participants also demonstrated significantly better social and emotional skills, healthier attitudes toward self and others, more positive social behaviors, better academic performance, and fewer conduct problems. The improvements followed by SEL programs reduced in magnitude during follow-up; however, the improvements were still statistically significant for at least six months after the interventions. Yet another two encouraging findings were that SEL programs worked well when delivered classroom teachers and other school staff, and the interventions were successful at all educational levels, from elementary to high school, and across geographic settings (urban, suburban, and rural schools).

There are several different SEL programs of varying quality to choose from. To orient educators about what programs to select and how to implement them, a guide has been

developed, “CASEL Guide: Effective Social and Emotional Learning Programs—Middle and High School Edition” (CASEL, 2015). CASEL has identified five interrelated sets of affective, cognitive, and behavioral competencies central to SEL programs:

- Self-management

- Self-awareness

- Relationship skills

- Social awareness

- Responsible decision making

The ACT interventions described in this thesis in Paper I and Paper III can be considered to be SEL interventions, or interventions that are fully compatible with SEL. For an article on how ACT and traditional SEL-interventions can be integrated, see Ciarrochi and Hayes (2016).

Stress is an overarching problem that is at the root of the development and recurrence of many major mental and somatic disorders. The transdiagnostic character of stress makes it an ideal target for primary and secondary prevention of mental health problems. That is also one reason why stress was chosen as the focus of the intervention in the Swedish study described in Paper I in this thesis (Livheim et al., 2015).

2.6 DEPRESSION AS A DIAGNOSIS AND DEPRESSIVE SYMPTOMS

2.6.1 Depression as a diagnosis and depressive symptoms: what these are

Depression is characterized by a state of low mood and a tendency to be inactive. Depression may be a normal reaction to obvious difficulties or challenges that happen in life (e.g., the death of a loved one); sometimes depression comes without apparent external causes. As with mental disorders in general, depression is usually the result of the complex interplay among several contextual factors, including life transitions and psychosocial, biological, environmental, genetic, and epigenetic factors across the life course. There are many similarities between depression in childhood and adolescence and adult major depressive disorder (MDD) (Maughan, Collishaw, & Stringaris, 2013). One common difference between MDD in children and youth and MDD in adults is that youth may exhibit increased irritability and self-destructive and aggressive behaviors.

Diagnostic criteria for depression focus on core symptoms of persistent and pervasive sadness and a loss of interest in activities, or no longer finding pleasure in activities that used to be pleasurable. Other symptoms associated with the MDD diagnosis include low self-esteem, suicidal thoughts or behaviors, excessive guilt, psychomotor agitation or retardation, and sleep and appetite disturbances (Maughan et al., 2013). A difference between the DSM diagnosis of MDD between youth and adults is that marked irritability is allowed as a central

symptom for depression for children and young people, but is not a central symptom for adults (American Psychiatric Association, 2013).

When using self-report measurements, a common way to capture subclinical signs of depression (MDD) is to ask questions centered on feeling low and losing interest in activities.

2.6.2 How common are depressive symptoms and a diagnosis of depression?

In prepubertal children, depression is relatively uncommon (1% to 2%) and rates are rather similar between boys and girls (Egger & Angold, 2006). But in the early teens, levels of depression begin to rise, and they rise more sharply among girls than among boys.

Most information about the lifetime prevalence of mental disorders usually comes from retrospective surveys. A concern has been that disorders have been undercounted because of recall bias. To find out if recall bias plays a role, Moffitt et al. (2010) used their famous Dunedin New Zealand birth cohort (n=1,037) and had participants indicate whether they had a mental disorder at the time or ever had had a mental disorder (retrospective survey). The researchers then compared that information with data that had been collected by the same respondents in the Dunedin cohort at ages 18, 21, 26, and 32 (prospective study). This information was gathered by professional interviewers who used a diagnostic interview covering DSM diagnosis at each of the four time points. And the differences were striking. For the diagnosis of MDD, the prevalence of depression among 18-year-old youth was 17.3% during the preceding year compared to 9.7% based on retrospective recall. They also checked what percentage of the sample had had a diagnosis of depression between ages 18 and 32 (cumulative lifetime prevalence ages 18 to 32); 41.4% of the participants had had a DSM-defined depression compared to 18.5% based on retrospective recall. They also checked other diagnoses and found patterns similar to depression. This means the prevalence of mental health disorders (as classified by DSM) might be twice as common in the population as what is reported in retrospective surveys.

Depression also has high rates of recurrence. Among children diagnosed with a depressive episode, within five years 70% have another depressive episode (Kovacs, Feinberg, Crousenovak, Paulauskas, & Finkelstein, 1984).

When using self-report measurements to capture subclinical signs of depression (MDD), results from a Swedish national study show that 36% of girls and 14% of boys age 15 had felt depressed more then once a week during the preceding six months (Folkhälsomyndigheten, 2014).

2.6.3 Depression among youth linked to later adverse outcomes and suicide

Having a depression in adolescence predicts a range of mental health disorders in adulthood, such as anxiety disorders, substance-related disorders, bipolar disorder, unemployment, and physical health problems (Thapar, Collishaw, Pine, & Thapar, 2012). Suicide is the second leading cause of death among youth, and depression among youth is a major risk factor for

suicide. More then half of youth suicide victims are reported to have had a depressive disorder when they died (Thapar et al., 2012).

2.6.4 Depression commonly overlaps with other mental health problems

Among school-aged youth, approximately 65% of those with depression also have at least one comorbid disorder (Maughan et al., 2013), and approximately 10% show two or more overlaps. The most common overlaps include anxiety disorders, dysthymia, and disruptive disorders such as ADHD, ODD, and CD.

2.6.5 Risk factors for depression and depressive symptoms

The risk and protective factors for mental health presented in Table 1 are also applicable to depression or depressive symptoms. It is worth highlighting again that ACEs are a prominent risk factor. The strongest risk factors for depression are exposure to stressful life events and a family history of depression (Maughan et al., 2013).

2.6.6 Treatments for depression and depressive symptoms

Best treatment practices and clinical guidelines vary among countries. Overall there are concerns about use of antidepressant drugs for youth under 18. Common concerns are the lack of evidence for long-term benefits of antidepressant drugs, studies that show limited effectiveness of antidepressant drugs for mild to moderate depression when compared to placebo, risk of increased aggression, the significant increased risk of youth suicide when medicating (Hetrick, Merry, McKenzie, Sindahl, & Proctor, 2007), and reports of an increase in adverse side effects from antidepressant drugs. A study by Sharma, Guski, Freund, and Gøtzsche (2017) found that the risk of suicidality and aggression doubled in children and adolescents when they used selective serotonin and serotonin-norepinephrine reuptake inhibitors (SSRIs).

As mentioned earlier, the national guidelines for Sweden issued by the National Board of Health and Welfare (Socialstyrelsen, 2017) suggest psychological treatments (such as CBT) as the first choice for mild to moderate depression among children and youth.

CBT can be given both individually or as group interventions; the latter can be delivered as primary prevention (to all) or indicated prevention (selecting youth who show signs of depression). A Cochrane review by Hetrick, Merry, McKenzie, Sindahl, and Proctor (2016) examined the effects of 84 randomized, controlled trials on CBT interventions for youth depression (Paper I, Livheim et al., 2015, is included in the review). Overall, the results show small positive benefits of depression prevention, for both the primary outcomes of self-rated depressive symptoms and the diagnosis of depression up to the 12-month follow-up. They also found that there were greater effects for interventions that had selected youth who showed signs of depression (indicated prevention). They conclude that more high-quality evidence is needed to be sure of the effectiveness of prevention programs.

However, another review came to a more positive conclusion. Stockings et al. (2016) examined the combined efficacy of universal, selective, and indicated preventive interventions for treatment of depression and anxiety among children and adolescents. They included 146 randomized controlled trials covering ages 5 through 18. They concluded that universal prevention interventions are efficacious in reducing internalizing disorders for up to 12 months, and selective and indicated prevention interventions are efficacious in the short term (at post-measurement).

Scaling up the response to the economic and public health burden of depression and anxiety would be a worthy investment. Chisholm et al. (2016) modeled what the savings would be across 36 countries between 2016 and 2030. Their conclusion is that, when the value of health is included, each invested dollar (or other currency) would give a 3.3 to 5.7 dollar return. Even just looking at the economic return without considering health indicated that each invested dollar would generate a 2.3 to 3 dollar return.

2.7 ACCEPTANCE AND COMMITMENT THERAPY/TRAINING (ACT)

Acceptance and commitment training/therapy (ACT) is a relatively recent form of cognitive behavioral therapy (CBT). The first book on ACT was published in 1999 (Hayes et al., 1999). The philosophy that ACT rests upon is functional contextualism (Hayes et al., 2012), and ACT uses a precise theory of language and cognition called *relational frame theory* (RFT; see Törneke, 2010, for a book-length description).

The core message of acceptance and commitment training/therapy (ACT) is to accept what is out of your personal control and to commit to action that improves and enriches your life. The "T" in ACT stands for training or therapy and can be used interchangeably depending on context. When used in conventional health care settings, ACT is typically referred to as acceptance and commitment therapy, and most studies are done on ACT as therapy. When ACT is used as prevention, in work and occupational or school settings, ACT is referred to as acceptance and commitment training. The main aim of ACT is to help people to live full, rich and meaningful lives. This is accomplished by imparting psychological skills that helps people to effectively deal with painful feelings and thoughts so they have less of an impact over a persons behavior. This is followed by guidance in clarifying what is truly important and meaningful for an individual—their values—and then to use that knowledge to guide, inspire, and motivate changes for the better in life. From a mental health professional's point of view, the goal of ACT is to help increase PF and decrease experiential avoidance, in order to increase well-being, both short and long term.

2.7.1 ACT treatments: state of the evidence

As of this writing, there have been at least 250 randomized controlled trials (RCTs) of ACT, and the vast number of studies of ACT now also make it possible to conduct meta-analyses. To date, 40 meta-analyses or systematic reviews have been conducted (Hayes, n.d.). These meta-analyses suggest that: (a) ACT attains better outcomes than wait lists or TAU (A-tjak et al., 2015), (b) ACT is overall at least as good as traditional cognitive behavioral therapy

(CBT) and other evidence-based methods (A-Tjak, Morina, Topper, & Emmelkamp, 2018; Hacker, Stone, & MacBeth, 2016; Ruiz, 2012), and (c) compared to traditional CBT, there are sometimes different factors that moderate the effects of ACT (and vice versa) (Burklund, Torre, Lieberman, Taylor, & Craske, 2017). ACT has been listed as an evidence-based therapy and training at large by the U.S. National Registry of Evidence-Based Programs and Practices since 2011 (NREPP, 2011).

There are still few high-quality studies that have rigorously tested the effectiveness of ACT among young people (see Halliburton & Cooper, 2015; Swain, Hancock, Dixon, & Bowman, 2015; Lønfeldt et al., 2017 for reviews). Studies on ACT for youth are usually brief interventions or case studies and have small sample sizes. However, the existing studies provide initial support for using ACT for youth mental health problems. So far, studies support that ACT can help participants with chronic pain, stress, depression, disruptive behavior disorders, OCD, PTSD, anorexia, autism disorders, and learning disorders (Halliburton & Cooper, 2015).

The systematic review by Swain, Hancock, Dixon, and Bowman (2015) included a total of 20 intervention studies. Since 2015 another 25 studies on ACT for young people have been published (that I am aware of); out of those 25 studies, 13 were on college or university students and 12 on youth or children. Those 12 studies covered areas such as its efficacy for

- Increasing attention among schoolchildren
- Improving mental health in adolescents
- Helping children with anxiety
- Helping adolescents with chronic pain
- Helping adolescents with orthodontic compliance
- Helping female high school students with social anxiety disorder
- Increasing health self-efficacy in 7- to 15-year-old children with diabetes mellitus
- Stress management (Hayes, n.d.)

I am aware of three published studies of ACT for depression or depressive symptoms for youth under the age of 20. Hayes, Boyd, and Sewell (2011) randomized 38 depressed adolescents to ACT or CBT in a psychiatric outpatient unit. The ACT group had greater improvements in their depressive symptoms. The second study is by Livheim et al. (2015), described in this thesis as Paper I. The third is a small (n=11) pre-post study of a 12-session ACT protocol by Petts, Duenas, and Gaynor (2017), which showed improvement on measures of quality of life and depressive symptoms that were clinically and statistically significant.

There are three published ACT studies for stress (that I am aware of) for youth under the age of 20. However, about 20 RCTs have been conducted and published on ACT stress management interventions in group format for adults and college or university students. The three studies covering ACT for stress aimed at youth under 20 are a study by Puolakanaho et al (2018), a study by Moazzezi, Moghanloo, Moghanloo, and Pishvaei (2015) and the study

by Livheim et al. (2015) described as Paper I in this thesis. Puolakanaho et al (2018) randomized a general sample of 15-year-old students (n = 249, 49% females) to a novel web- and mobile-delivered five-week ACT intervention program or to a control group. The intervention group showed a small but significant decrease in overall stress and an increase in academic buoyancy. The ACT intervention program was given in two versions, one with personal meetings with the therapist and one without personal contact; both were found to work equally well. Moazzezi et al. (2015) randomized 40 youth (ages 7 to 15) with diabetes to ACT or a passive control group and found that ACT was effective in reducing perceived stress.

2.8 CAN PSYCHOLOGICAL FLEXIBILITY HELP DECREASE YOUTH MENTAL HEALTH PROBLEMS?

2.8.1.1 Psychological flexibility: an exciting construct in psychology

In science, a "construct" usually means an explanatory variable that is not directly observable. Two examples are intelligence and motivation; neither is directly observable, but each can be useful when it comes to explaining a phenomenon in psychology. Within the ACT community (and contextual behavioral science at large) there has been a focus on finding useful constructs that can help us understand the processes that promote mental health and that are involved in producing human suffering. If such constructs were to be found and shown to be beneficial in helping people across a wide range of mental health problems, we would also want to be able to increase the levels of those constructs. A promising construct to this end is that of *psychological flexibility* (PF), defined as the ability to fully contact the present moment with consciousness and to change or persist in behavior in accordance with valued ends (Hayes, Louma, Bond, Masuda, & Lillis, 2006).

Under a later heading (*2.8.2.3. What is psychological flexibility?*), I will unpack in greater detail what PF is, but I want to begin by explaining why I am so excited about the possibilities of this construct to be helpful for youth.

2.8.1.2 We can increase psychological flexibility

Many psychological constructs are good for predicting, but cannot easily be moved. For examples, let us use the three popular cognitive constructs : *intelligence*, the Big 5 personality construct of *conscientiousness* (Matthews, Deary, & Whiteman, 2003), and *grit* (Duckworth, Peterson, Matthews, & Kelly, 2007). It has been shown that for victims of ACEs (e.g., child maltreatment, child abuse, loss of a parent), intelligence is a protective factor (one of many) (Wingo, Fani, Bradley, & Ressler, 2010). Intelligence also correlates positively with psychological well-being in youth (e.g., Wigtil & Henriques, 2015). As for conscientiousness, there is usually a positive relationship between conscientiousness, satisfaction with life, and self-reported well-being (Steel, Schmidt, & Shultz, 2008). And antisocial and criminal behaviors has been linked to low conscientiousness (Ozer & Benet-Martínez, 2006) as well as unemployment, homelessness, and imprisonment (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009). Low conscientiousness and low agreeableness

(another Big 5 construct), taken together, are also associated with substance abuse (Walton & Roberts, 2004). A more recent construct that has become very popular in neuroscience is *grit*, defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007; Von Culin, Tsukayama, & Duckworth, 2014). However, there is some debate about whether grit is its own construct or if it is so close to the cognitive construct of intelligence that they are one and the same (Crede, Tynan, & Harms, 2016).

It would be outstanding if we could increase levels of intelligence, conscientiousness, and grit among youth! However, there is one severe limitation if one aims to help children, youth, and young adults: these three constructs are considered to be personality traits and therefore not easy to change. Yes, they have good predictive properties (of interest for recruitment to a job, for instance). However, since personality traits are considered to be stable and not subject to change, they are not of much help if one wants to help build resilience and decrease mental health problems. For these efforts we need to focus our interventions on processes we can change—and processes that predict good outcomes if we increase them. So basically, it would be ideal if we could find a construct that (a) we can increase among youth and (b) when we increase it, helps to build mental health and life quality and decreases mental health problems among youth. Here the construct of PF offers something new and unlike any of the others just discussed.

2.8.2 Psychological flexibility

2.8.2.1 Psychological flexibility is connected to mental health and mental health problems

There are several studies that establish the connection between mental health and mental health problems and PF among youth and adults (Kashdan & Rottenberg, 2010).

In a representative sample of 1,035 participants (ages 18 through 74), Gloster, Meyer, and Lieb (2017) investigated the connection between PF and mental health. They found that in the general population, PF moderated outcomes such as physical and mental health and well-being. This effect was strongest for the predictors of stress, depression, and anxiety. They also found a dose-response relationship: higher levels of PF were more protective. Their conclusion: since it is possible to train PF, targeting and training people in PF could promote various health outcomes in the general population.

An example for youth is a systematic review and meta-analysis by Lønfeldt, Silverman, and Esbjørn (2017). They argue that we need to understand the mechanisms by which treatments work, and they set out to test how three popular constructs—PF, mindfulness, and metacognitions—explained anxiety problems among youth. They found large effect sizes for the explanatory value of PF for anxiety in youth (and medium effects for mindfulness and medium-large effects for metacognitions).

A study by Casier et al. (2013) found that PF plays an important role in how youth with diabetes or cystic fibrosis experience their daily mood.

2.8.2.2 Psychological flexibility can be increased and produce good outcomes for people suffering from various problems

One key feature that makes psychological flexibility such a useful construct is the combination of PF proving to be useful for increasing mental health across a wide range of mental health problems *and* a growing literature showing that we actually can increase PF. Some examples of successful increases of PF and positive outcomes from studies on adults include reducing negative effects of stress (Hofer et al., 2018) and helping people in difficult and stuck populations, such as treatment-resistant clients with severe epilepsy, panic disorder, and agoraphobia (Gloster et al., 2015; Clarke, Kingston, James, Bolderston, & Remington, 2014; Lundgren, Dahl, & Hayes, 2008). In a study by Gloster et al. (2015) they compared epigenetic changes (5-HTTLPR polymorphism) and PF before and after treatment. They found increased PF as well as positive epigenetic changes and found a correlation between those two variables. In conclusion, they suggest that "The endophenotype psychological flexibility may help bridge genetic and psychological literatures" (p. 399).

2.8.2.3 What is psychological flexibility?

To reiterate, PF is defined as the ability to fully contact the present moment with consciousness, and to change or persist in behavior in accordance with valued ends (Hayes, Louma, Bond, Masuda, & Lillis, 2006).

There are six processes that make up the PF model: (a) contact with chosen values, (b) acceptance, (c) flexible contact with the now/present moment focus, (d) cognitive defusion, (e) committed action, and (f) self as context. According to the model, if we want to help people by increasing their PF, we should aim at facilitating those six processes.

Increasing PF via those six processes can promote mental health and decrease mental health problems. What usually creates problems for people is the opposite of psychological flexibility—that is, psychological *in*flexibility. And that is the flip side of the six processes, namely: (a) values problems; (b) experiential avoidance; (c) loss of flexible contact with the now/present moment focus; (d) cognitive fusion; (e) inaction, impulsivity, or avoidant persistence; and (f) attachment to a conceptualized self.

A meta-analysis of the six components within ACT (Levin, Hildebrandt, Lillis, & Hayes, 2012) shows support for each process on its own for five out of six processes (the process not supported is self as context).

So let us unpack the definition of PF and give short examples of processes used to train it.

"The ability to fully contact the present moment with consciousness, and to change or persist in behavior in accordance with valued ends."

We'll begin with the first part:

"The ability to fully contact the present moment with consciousness"

We increase this capacity by practicing being in the present moment on purpose. Training in mindfulness is one way to do this: other methods are to frequently check in and become present in the body, or to notice and name emotions in the moment. The term "fully contact" is also central in the sentence, as it implies "to contact the present moment without psychological defense" (that is, without defenses such as trying to avoid difficult thoughts or sensations in the present moment). We develop this capacity by opening up to inner experiences we are contacting in the present moment through our central nervous system. This is sometimes referred to as acceptance, opening up, or acknowledging what *is* right now.

" . . . and to change or persist in behavior in accordance with valued ends."

Here the first step is to identify our deeply held values. Usually those are long-term values and outcomes that are universal, like having deep and meaningful relationships. Questions asked to help clients identify what they want to strive toward in life could be: "In the best of worlds, if everything was possible, what would you like your life to be filled with? I am not asking what would be realistic for you to achieve, or what you or others think you deserve. The important thing for you is to make clear to yourself what you want to aim for in the best of situations." Once values are identified, the next step is to identify actual behaviors to do more of, as they are in line with those freely chosen values, and behaviors to do less of, as they are not in line with those chosen values.

A concrete example could be a teenager who wants to ask a potential partner out on a date. The actual behavior identified for this person (behavior in accordance with one's values) that is in line with the value of having an intimate romantic relationship is walking up to the potential partner and saying "Hi! Remember how in history class you mentioned [that new movie] and we both said we wanted to see it? It's opening on Friday, and I wonder if you'd like to go together?" If our teenager contacts the present moment as it is just before asking, there probably will be a lot of "yucky" sensations, like hot cheeks, sweaty palms, palpitating heart, and thoughts like "He/she will say no; I am not attractive enough for this person; I'll make a fool of myself." Sensations and thoughts like these are natural, and probably any teen has some history of being teased about their appearance, or being rejected. So the brain and body does just what it is designed to do—namely warn us away from potential hurt. However, living a vital life involves taking risks—sometimes getting what we want, other times being hurt. In ACT we work with strategies to open up, make room for "yucky" sensations, see them as they are (without psychological defense), and do what is important. In this case, open your mouth and say the words.

2.8.3 Assessment of psychological flexibility

There is a common agreement among researchers and clinicians that it is not enough to only evaluate the effectiveness/efficacy of interventions. Another purpose of treatment research is to also gain a theoretical understanding of how treatments achieve their effects (Kazdin, 2007; Murphy, Cooper, Hollon, & Fairburn, 2009).

There are many important reasons why we should understand the processes that account for therapeutic change. If we know what leads to changes and why, we probably will be better able to optimize therapeutic change and to direct stronger, different, better, or additional strategies that can trigger the critical change process(es).

A real-world example is a randomized worksite comparison of ACT acceptance and a popular stress management intervention called *stress inoculation training* (SIT) (Flaxman & Bond, 2010). Working individuals (n=107) were randomly assigned to three conditions: ACT, SIT, or a waitlist control group. The interventions consisted of two half-day training sessions. ACT and SIT was equally effective in reducing psychological distress. However, mediation analysis indicated that the positive effects of ACT resulted from an increase in PF and not from a change in dysfunctional cognitive content. The hypothesis in the SIT condition was that a reduction in dysfunctional cognitions would mediate the positive outcomes, but this was not so. For me, as a treatment developer, the clinical implications of such results motivate me to include more components with the promise of increasing PF and to drop those components aimed at reducing dysfunctional cognitive content (which also is theoretically incongruent with ACT, as its focus is to alter the individual's relationship to cognitive content).

In an ideal future I hope that we will have discovered mechanisms of change and mediators that help us talk about evidence-based processes (e.g., exposure, PF, behavioral activation) instead of the current "competition" among treatment models (e.g., ACT, DBT, CBT, MST, FAP, CFT, psychodynamic-therapy).

If a construct like PF can better help us to understand, predict, and influence human behavior, it could be used by any developer of treatments regardless of what their treatment is labeled. It could be used in applications of traditional CBT as well as treatment traditions outside CBT, such as humanistic, existential, or analytic approaches. Potential benefits from understanding mechanisms of change and mediators that cut across human behavior, clinical and nonclinical samples, and treatment traditions could include better communication and cooperation among treatment traditions and faster development of more effective treatment interventions.

Beyond finding such a construct, we also need to be able to reliably measure it.

2.8.3.1 Measuring psychological flexibility among adults

The most common instrument used to measure PF among adults is the Acceptance and Action Questionnaire (AAQ-II), a unidimensional, seven-item Likert-style questionnaire. The instrument has adequate psychometric characteristics (Bond et al., 2011). AAQ-II has been adapted for specific populations, such as pain patients, smokers, and people coping with epilepsy, and has been adapted to different contexts, such as the work setting. There are two studies that raised some concerns about AAQ-II. Wolgast (2014) suggests that the instrument seems, to a significant extent, to measure psychological distress, and Tyndall et al. (2018)

raise concerns over discriminant validity (testing of an instrument to see that it doesn't overlap too much with another construct).

2.8.3.2 Measuring psychological flexibility among children and youth

The most common instrument used to measure PF among children and youth is the Avoidance and Fusion Questionnaire for Youth (AFQ-Y) (Greco, Baer, & Lambert, 2008). There are two versions of AFQ-Y: the 8-item version (AFQ-Y8) and the 17-item version (AFQ-Y17). There have been five published papers on the psychometric properties of the AFQ-Y among children and youth (Greco et al., 2008; Livheim et al., 2016; Cederberg, Weineland, Dahl, & Ljungman, 2018; Szemenyei et al., 2018; Valdivia-Salas, Martín-Albo, Zaldivar, Lombas, & Jiménez, 2017). Overall, those studies support the reliability, generalizability, and convergent validity of both AFQ-Y17 and AFQ-Y8. The two studies by Cederberg et al. and Szemenyei et al. examined only AFQ-Y8, and the study by Valdivia-Salas et al. examined only AFQ-Y17. In the studies by Greco et al, Valdivia-Salas et al., and Livheim et al., AFQ-Y17 showed an inferior fit to a one-factor structure. In three out of four studies on AFQ-Y8, a good fit to a one-factor structure was found. In the study by Cederberg et al., a one-factor structure of AFQ-Y8 was not unequivocally supported. Livheim et al. (2016) suggest the use of AFQ-Y8 before the 17-item version because the 8-item version is shorter and shows a better fit with a one-factor structure.

There are two studies published on the psychometric properties of the AFQ-Y for adults (Fergus et al., 2012; Schmalz & Murrell, 2010); both conclude that the instrument has adequate psychometric characteristics.

The AFQ-Y has been translated into several languages, including Swedish (Livheim et al., 2016), Hungarian (Szemenyei et al., 2018:), Italian (Ristallo, Schweiger, Oppo, Pergolizzi, & Presti, 2015), Korean (Kim, 2016), Dutch (Blokzijl, 2005), and Japanese (Ishizu, Shimoda, & Ohtsuki, 2013).

2.8.4 Why do interventions work? Analysis of mediators

The researcher Kazdin (2009) makes an interesting observation: "After decades of psychotherapy research and thousands of studies, there is no evidence-based explanation of how or why even the most well-studied interventions produce change, that is, the mechanisms through which treatments operate." The Lancet Psychiatry Commission on psychological treatments research in tomorrow's science (Holmes et al., 2018) picks up this thread, and their first recommendation is that we need to understand how existing treatment works; specifically, we need to clarify the key mechanisms through which interventions work. As mentioned, in ACT there is a decided focus on this topic: ACT has a clear, elaborated, and testable theory and has identified promising constructs (e.g., PF) that can be manipulated and induce positive outcomes. ACT has constructed measures that can capture the targeted construct (e.g., AAQ-II for adults and AFQ-Y8 for children and youth) and has

tested the six facets of the construct in laboratory-based component studies (Levin, Hildebrandt, Lillis, & Hayes, 2012). And studies have been and are conducted that measure the construct on different sites and in different populations.

In our research, PF has played an important role in many aspects. PF has been the guide when we have constructed the treatments. In developing the treatments we have used, one overarching aim has been to maximize an increase in PF among the participants. We measured PF in study I, investigated the psychometric properties of AFQ-Y in Paper II, and set out to test PF as a mediator of change in Paper III. To date, most studies have not investigated mechanisms of change (Holmes et al., 2018). Understanding the mechanisms through which interventions work is a huge task that cannot be accomplished a single study; however, finding mediators is one important step toward understanding mechanisms of change.

Here is a definition of a mediator: "An intervening variable that may account (statistically) for the relationship between the independent and dependent variables. Something that mediates change may not necessarily explain the processes of how change came about. Also, the mediator could be a proxy for one or more other variables or be a general construct that is not necessarily intended to explain the mechanisms of change. A mediator may be a guide that points to possible mechanisms but is not necessarily a mechanism" (Kazdin, 2009, p. 419).

Even when studies have investigated mediators of change, it can be difficult to draw conclusions because of insufficiently rigorous methodology (Kazdin, 2007).

To establish mediators and mechanisms of change in psychological treatment, there are several requirements. Here are the steps, briefly summarized (for an in-depth explanation, see Kazdin, 2007).

Strong association: A strong association is needed between the intervention, mediator, and therapeutic change. Statistical mediation analyses must be made to show the relationships.

Specificity: A specific association between intervention, mediator, and outcome must be demonstrated.

Establishment of a timeline: This one requirement often has been overlooked in studies on potential mediators. If a mediator should be able to mediate the results, the mediator needs to "kick in" before changes in outcome.

Consistency: Observed results should be replicated across several studies, samples, and conditions.

Experimental manipulation: Manipulating the mediator shows the impact on outcome.

Dose-response relationship: Does more of the mediator lead to a better outcome?

Plausibility or coherence: It should be possible to describe a coherent, plausible process, from construct to change: precisely what the construct does, how it works, and how it leads to the outcome.

2.9 SUMMARY

The overarching goal of this background has been to provide a context for the three papers described in this thesis. Mental health problems are common among youth, and the burden of internalizing mental health problems has increased globally during the period 1950 to 2000, becoming more stable from 2000 to 2010. Sweden stands out among the Nordic countries, with a slight increase in suicides and a marked increase in internalizing mental health symptoms. The increase in self-reported mental health problems in Sweden is mirrored by a similar increase in terms of psychiatric diagnoses, medicalization for psychiatric diagnoses, and use of mental health services during the period 2006 to 2016. These increases are equally sharp for both boys and girls, but girls report more problems, for reasons that are not fully understood; however, theories have been suggested. Two of them include a premise that girls overall have higher educational expectations and might be more susceptible to interpersonal stressors.

In the industrialized countries, there have been substantial increases in the provision of treatment (antidepressants in particular) from 1990 to 2015 (Jorm et al., 2017). Despite these changes, there was no evidence for a decreased prevalence of disorders or symptoms in any of the examined countries over this period. This may require us to rethink our models for mental health. A "staging approach" was presented; this approach clarifies how we can intervene at different stages on the continuum of mental health, up to the late stages of severe suffering. Such an approach helps us catch early opportunities to intervene, before substantial disability sets in. Several examples were presented for how we can prevent and treat mental disorders and promote mental health among youth. It has been suggested that in order to make evidence-based interventions available at a large scale, we need to transfer some of the mental health care responsibilities from highly specialized staff to less-specialized staff. The interventions in Paper I and Paper III were suggested for different levels in the staging model.

There are risk factors for mental health problems, and there are also protective factors. Luckily, most young people do not suffer from mental health disorders; understanding and increasing the factors that protect against these disorders, and eliminating or decreasing the risk factors, are important steps in helping youth.

Because stress and depression are common and recurring problems among youth, these were described in more detail, together with a description of the most common interventions for alleviating problems from stress and depressive symptoms and their effectiveness.

There are many published studies (250 +) on the effectiveness of ACT; however, there are still few high-quality studies that have rigorously tested the effectiveness of ACT among youth. The studies that do exist provide initial support for using ACT for youth mental health problems.

A large, important, and much-needed effort within treatment research is to understand how treatments work. Among the many reasons for finding theories and constructs that can explain mental health problems and how they come about, a primary one is the opportunities that this knowledge will open up for building more efficient interventions and, hopefully, treatments that works transdiagnostically. In ACT, we have identified a construct called *psychological flexibility*. PF predicts good outcomes, and findings support the belief that PF can be increased. More research is needed to see whether ACT can be a transdiagnostic intervention for helping youth, and whether increasing PF produces good outcomes among youth.

3 AIMS OF THE THESIS

3.1 OVERALL AIMS

The overall aim of the present thesis was to develop and test transdiagnostic group treatments for different populations of youth. We wanted to test the interventions under real-world conditions when delivered by less-specialized staff. To begin understanding possible mechanisms of change in those interventions, we conducted the first replication on youth of the psychometric properties of an instrument (AFQ-Y). This instrument is promising for detecting the construct of psychological flexibility. We also wanted to explore whether the construct mediated the outcomes in one of the studies.

3.1.1 Study I

Objective: To test the effectiveness of a brief ACT group intervention's ability to transdiagnostically be of help for youth with subthreshold symptoms of stress and depression. We wanted to test the intervention under real-world conditions in schools when delivered by less-specialized staff.

Hypothesis: We hypothesized that the ACT group interventions would be more effective in reducing symptoms of stress and depression then TAU in the form of individual support from the school nurse.

3.1.2 Study II

Objective: To do the first replication on youth of the psychometric properties of the instrument (AFQ-Y17). We also wanted to test how the instrument functions in Swedish as well as test the validity and reliability of the shorter AFQ-Y8 version of the AFQ-Y.
Hypothesis: We hypothesized that the Swedish versions of both AFQ-Y17 and AFQ-Y8 would have adequate psychometric characteristics.

3.1.3 Study III

Objective: To develop and test the feasibility, effectiveness, and potential mediation of effects in a short transdiagnostic ACT group intervention for youth with comorbid problems in residential care. We wanted to test whether the addition of the ACT treatment to TAU would yield improvements compared to TAU alone over an 18-month period. We wanted to test the intervention under real-world conditions in a multicenter study when delivered by less-specialized staff.

Hypothesis: We hypothesized that the addition of the ACT intervention would be feasible, that it would have significant effects from pre- to post-treatment on the primary outcomes of depression and anxiety, and that changes would be mediated by improved PF.

4 EMPIRICAL STUDIES

4.1 STUDY I: THE EFFECTIVENESS OF ACCEPTANCE AND COMMITMENT THERAPY FOR ADOLESCENT MENTAL HEALTH: SWEDISH AND AUSTRALIAN PILOT OUTCOMES

4.1.1 Aim

To test the effectiveness, feasibility, and transdiagnostical potential of a brief ACT group intervention, we wanted to test the same ACT intervention for decreasing subthreshold symptoms of stress and depression among youth. Other aims were to test the intervention under real-world conditions in schools when delivered by less-specialized staff, and in two slightly differing cultural contexts (Sweden and Australia).

4.1.2 Methods

4.1.2.1 Setting, inclusion, and procedure

Sweden: We screened 247 youth (ages 14 to 15) in a public high school. Youth who scored above the 80th percentile on scales measuring stress and mental health problems were invited to participate. Youth who had severe mental health problems were excluded and referred to appropriate help. We included 32 youth who were randomized to get the ACT intervention or were referred to individual support from the school nurse (TAU).

Australia: A sample of 66 youth (ages 12 to 18) in five schools with mild to moderate depressive symptoms were nominated by school counselors/welfare coordinators and offered participation. Youth with severe mental health problems were excluded, making sure they received proper help.

The primary outcome was stress in Sweden and depression in Australia. Between-group effects were calculated from pre- to post-treatment using mixed-model repeated measure (MMRM) analyses. Increased PF was the suggested process in both studies and was measured at pre- and post-treatment. Qualitative questions was used for assessing levels of youth satisfaction with the intervention.

4.1.2.2 The ACT intervention

The intervention used in both studies was a manualized eight-week group program called the "ACT Experiential Adolescent Group," created in Australia by Hayes and Rowse (2008). Each session lasted approximately 90 minutes and was delivered at school. The program is designed to facilitate adolescents' experience of the six ACT processes that make up PF in an experiential way. Therefore the program uses experiential media; for example, role-play and painting. In Sweden the intervention was delivered by two students in clinical psychology, with clinical training in CBT and four days of ACT training by this thesis author, Fredrik Livheim (an internationally recognized peer-reviewed ACT trainer). In Australia the intervention was delivered in three schools by a registered psychologist with the help of a

clinical psychology graduate student. In two schools it was delivered by the school's own counselor. All staff got at least two days' training in ACT by Louise Hayes (author of the protocol and also an internationally recognized peer-reviewed ACT-trainer).

4.1.3 Main results

Compared to the control group, youth in the Swedish study who received the ACT intervention reported significantly lower levels of stress, and the effect size was large (Cohen's $d = 1.20$, $p = 0.009$). They also reported a marginally significant decrease in anxiety, with a large effect size (Cohen's $d = 0.80$, $p = 0.057$), and a marginally significant increase in mindfulness skills with a medium effect size (Cohen's $d = 0.75$, $p = 0.067$).

In the Australian study, the favorable effects for the participants in the ACT intervention as compared to the control group were significant reductions in depressive symptoms, and the effect size was large (Cohen's $d = 0.86$, $p = 0.008$). They also reported significantly increased PF with a medium effect (Cohen's $d = 0.73$, $p = 0.021$).

In both studies, session attendance was high, dropout rates were low, and qualitative reports was almost unanimously positive.

4.1.4 Limitations and strengths

In the end of Paper I, we list ten different limitations and discuss each of them:

1. Sample sizes were small.
2. The majority were girls.
3. All participants were volunteers.
4. The Swedish school stood out by being in a high socioeconomic area.
5. In the Australian study there were large differences at preintervention regarding levels of depression.
6. The ACT group got more intervention time compared to TAU.
7. The ACT intervention in Sweden was compressed into 6 weeks instead of the normal 10 to 12 weeks.
8. All data are based on self-report questionnaires.
9. AFQ-Y17 was used in Sweden and AFQ-Y8 in Australia.
10. There was no long-term follow-up.

I see all those 10 limitations as valid. Three items mentioned under future directions can also be seen indirectly as additional limitations:

- We did not design the study in such a way that we could establish a timeline needed to examine whether PF mediated outcomes; to do that, we should have made measurements of PF and outcomes during the intervention to check whether changes in PF came before outcomes.
- We did not measure how the group leaders adhered to protocol or whether they delivered the intervention in a highly competent way.

- The ACT intervention was not compared to attention control or another intervention that has proven to be effective.

One limitation that I consider worth highlighting is limitation number 5. In the Australian study, the participants in the ACT group had significantly higher levels of depression before the intervention. This means that an alternative interpretation of the great reductions of depression in the ACT group could be a result of regression toward the mean (depression tends to get better over time even without intervention).

There were several strengths to this study. The interventions were delivered by less-specialized staff (students in Sweden, none of whom had a long history of working with ACT), and with two to four days of training in ACT they delivered interventions under real-world conditions in schools and got promising results. Another factor to take into account when interpreting the results is that the study was severely underpowered. To attain a power of 0.85, with $p < .05$ and find a moderate effect size (Cohen's $d = 0.5$), we would have needed at least 150 participants in the Swedish study alone. And we had a total of 32 participants. Since the observed effect sizes were rather large, some of them became statistically significant. Looking at the raw scores from pre- to post-treatment, one can see that youth in the ACT intervention are moving in a positive direction on several outcomes. It is reasonable to suppose that with larger sample sizes, more outcomes could well have been statistically significant.

An interesting artifact in this study is the finding of increased mindfulness skills (marginally significant) from ACT in the Swedish study. We deliberately excluded all formal mindfulness training in the Swedish interventions and still saw effects on increased mindfulness skills. I interpret this as an indication of ACT being a "shortcut" to increasing mindfulness skills. Formal mindfulness training (such as sitting meditation) has shown several positive benefits. However, it is often a challenge to get youth to do sitting meditation long enough to produce good effects—sitting meditation is not readily embraced by all youth. If we can teach mindfulness skills "just" by ACT via metaphors, role-play, drawing, and the like, and this increases their mindfulness skills and decreases mental health problems, this is an interesting finding.

4.2 STUDY II: PSYCHOMETRIC PROPERTIES OF THE AVOIDANCE AND FUSION QUESTIONNAIRE FOR YOUTH: A PSYCHOLOGICAL MEASURE OF PSYCHOLOGICAL INFLEXIBILITY IN YOUTH

4.2.1 Aim

The aim of Study II was to do the first replication on youth of the psychometric properties of the instrument AFQ-Y17. This instrument measures PF, which might be an important construct for understanding and treating mental health problems among youth. We wanted to test the instrument in a slightly different cultural context (Sweden versus the United States) and in that process test the validity and reliability of the shorter version, AFQ-Y8.

4.2.2 Methods

We used data collected in the study described in Paper III. The sample included 160 adolescents (ages 15 through 20) with psychosocial problems who had been mandated to inpatient care within the National Board of Institutional Care (NBIC; a Swedish government agency that delivers institutional care for youth (12-20 years). The sample consisted of 41% girls and 59% boys, with 59% in the age span 15 through 17, and 41% aged 18 through 20.

At each of the eight participating units (spread all over Sweden geographically) we trained a test administrator in how to administer the measures and how to give information in plain language and in text so that the participating youths could provide their informed consent.

We checked internal consistency by assessing Cronbach's alpha. To evaluate construct validity regarding convergent, concurrent, and discriminant validity, we checked correlations between AFQ-Y and AAQ-II (supposed to measure PF) and the Beck Youth Inventory – II (which measures related constructs, such as depression, but not related constructs, such as anger). To further establish the validity of the AFQ-Y, we made bootstrapped confirmatory factor analyses to assess factor loadings and fit statistics. To examine discriminant validity between BDI-Y (which measures depression) and AFQ-Y, we used a two-factor confirmatory factor analysis. The stability (test-retest) of AFQ-Y was assessed by examining Pearson's correlation between results from each participant when they answered the AFQ-Y two weeks apart. When checking stability, we did not use data from participants who took part in an ACT intervention. We also investigated whether there were differences in psychometric properties depending on age or sex.

4.2.3 Main results

Overall, our results confirmed reliability and validity with regards to measuring PF. AFQ-Y showed reliability in terms of internal consistency (AFQ-Y17 alpha .93, AFQ-Y8 alpha .90) and good test-retest reliability.

This study supports the construct validity of AFQ-Y in terms of concurrent, convergent, and discriminant validity. Statistically, the AFQ-Y8 showed a good fit to a single-factor structure, but for AFQ-Y17 we found a poorer fit to a single-factor structure.

Our findings indicate that AFQ-Y may be a valuable clinical tool for measuring PF among youth.

4.2.4 Limitations and strengths

Three limitations are listed and discussed at the end of Paper II:

- The whole sample consisted of youth with psychosocial problems who had been mandated to inpatient care; this warrants some caution when generalizing the results to nonclinical populations.
- Analyses of AFQ-Y8 were made by isolating those 8 items from the full 17-item scale; this may have affected the participants' style of responding.
- There were some overlap between PF as measured by AFQ-Y, and anxiety (r =.69) and depression (r =.75) as measured by the Beck Youth Inventory. In future studies researchers ought to be on the lookout for excessive overlap with general psychological distress, anxiety, and depression. Wolgast (2014) and Tyndall et al. (2018) have raised concerns that this kind of overlap might be a problem with AAQ-II, which is commonly used for measuring PF in adults.

Strengths of this study include the fact that it is the first replication of the psychometric properties of the AFQ-Y among youth, and it confirms the usefulness of the instrument to capture PF among youth with adequate reliability and validity. This study adds to the knowledge base about PF among youth. Other strengths are that we have tested the instrument against measures that ought to measure the same construct, similar constructs, and dissimilar constructs, as well as tested the test-retest properties of the instrument.

4.3 STUDY III: A QUASI-EXPERIMENTAL, MULTICENTER STUDY OF ACCEPTANCE AND COMMITMENT THERAPY FOR ANTISOCIAL YOUTH IN RESIDENTIAL CARE.

4.3.1 Aim

The aim of Study III was to develop a short transdiagnostic ACT group intervention for youth with comorbid problems and test its feasibility and effectiveness for youth with comorbid problems in residential care. We wanted to test whether the addition of the ACT treatment to TAU would yield improvements compared to TAU alone over an 18-month period, and whether such effects would be mediated by PF. We wanted to test the intervention under real-world conditions in a multicenter study when delivered by less-specialized staff.

4.3.2 Methods

4.3.2.1 Setting, inclusion, and procedure

We included 160 adolescents (ages 15 through 20) with psychosocial problems that had been mandated to inpatient care within psychiatric units at the NBIC. It is the same sample used in Study II. The sample consisted of 41% girls and 59% boys, with a mean age of 17.3. The study had a quasi-experimental design. All 160 participants received treatment as usual (TAU). Ninety-one youth at five sites received an addition of an ACT group intervention (TAU+ACT) totaling 12 hours, and the remaining 69 youth at three matched sites received only TAU. Participants were measured at five time points: before treatment (TI), two weeks later (T2), four weeks later (T3), three month later (T4), and 18 months later (T5). We trained a test administrator at each site, a person not involved in treatment of the youth who collected informed consent and conducted all testing. Primary outcomes were self-reported depressive symptoms and anxiety. Secondary outcomes were anger, quality of peer relationships, antisocial behavior, and self-concept. The primary process variable was improvement of PF.

4.3.2.2 The ACT intervention

The intervention was a manualized six-session (of two hours each) intervention called "ACT – Living life fully." We developed the intervention by examining a vast array of protocols for ACT groups, especially protocols aimed at youth or substance abuse. We then created the protocol and conducted two pilot tests. First we pilot-tested the intervention in a small (n=24), unpublished, randomized controlled trial (Biörklund & Wall, 2009) for students in upper secondary school who were screened and found to have mental health problems. We saw significant reductions in stress, with a large effect size, and nonsignificant small to medium effects in favor of ACT on decreased mental health problems, use of alcohol, PF, and acceptance. The second pilot-testing was done at five units within NBIC to see if the intervention could be implemented and find out if the intervention was appreciated by youth and staff.

The intervention is designed to facilitate adolescents' experience of the six ACT processes that make up PF in an experiential way. Sessions focused on hands-on experiential exercises,

role-plays, psycho-education, and use of metaphors. Youth were given an MP3 player with exercises focusing on acceptance and self-compassion that they could use between sessions. Groups were general small, with two to six participants. The content of the sessions is briefly outlined in Table 2.

Table 2. Description of group sessions

Session	Major content
Individual meeting before group	Describe the program. Establish rapport. Functional assessment of problematic behaviors by the exercise "lifeline." Validate pain the youth might be experiencing.
Session 1: Living life fully	Group rules. Role-play of a fictive youth with problems with functional assessment of the fictive youths' emotions and behaviors. Normalize that we will encounter painful emotions when living life. Beginning to identify personal values.
Session 2: What is important in my life?	Review of previous session. Follow-up of practice between sessions (both conducted in all sessions 2 through 6). Identifying personal values by using a "life compass."
Session 3: What's stopping me from living life fully?	Identifying barriers and how to deal with them to live life according to values. Problem solving around barriers that can be influenced; practice of acceptance for obstacles in life that are hard to change by will.
Session 4: How can I deal with hindrances in life?	Concrete strategies for dealing with difficulties in life. Model ways to respond to urges and emotions by role-plays of metaphors (e.g., chess metaphor, different ways to respond to thoughts represented as papers tossed at the facilitator).
Session 5: To be kind to myself	To give myself what I need, practice of self-compassion. Self-compassion when encountering difficulties in life. Self-compassion exercises that include perspective-taking, like imagining my 30th birthday, and writing a love letter to myself as a six-year old.
Session 6: How can I create the life I want to live?	Repetition of all six sessions. Action plans for using what they find useful when returning to society. Identifying networks of adults, peers, and organizations that can help in maintaining a healthy and vital lifestyle. Detailed plan for how to activate those networks.

A total of 46 treatment assistants from the TAU+ACT units received eight days of training in ACT at large, and in this specific intervention led by Fredrik Livheim, this thesis author (and an internationally recognized peer-reviewed ACT trainer). The treatment assistants usually did not have formal psychotherapeutic training, and a large proportion of them did not have education at university level.

Our research questions were: would addition of an ACT-based intervention to TAU lead to improvement in youth psychosocial functioning? And if there were effects, would they be mediated by increases in PF? Taken together, the answer to those two questions was affirmative. This transdiagnostic ACT intervention delivered by regular ward staff shows promise for adolescents in residential care. Furthermore, improvements regarding decreased anxiety appear to be mediated by increased PF as predicted by the theory.

4.3.3 Main results

This transdiagnostic ACT intervention shows promise regarding helping adolescents in residential care when it is delivered by regular ward staff. We observed several positive outcomes in favor of the TAU+ACT group as compared to TAU alone. Furthermore, as predicted by the theory, PF appear to have mediated decreased anxiety (but not depression).

Compared to the control group (TAU), youth who received an addition of the short ACT group intervention (TAU+ACT) showed several beneficial improvements in our ITT analyses. After the intervention (T4), the TAU+ACT group had decreased symptoms on the primary outcome variables of depression (Cohen's $d = 0.34$, $p = 0.041$) and anxiety (Cohen's $d = 0.38$, $p = 0.003$), with small effect sizes. Decreased anxiety was to a large extent mediated by the primary process variable PF. For the secondary outcomes, the TAU+ACT group, compared to TAU, showed significant decreases in peer problems and hyperactivity and were found to have better overall psychosocial functioning, with medium to small effect sizes. Improvements regarding fewer peer problems and better psychosocial functioning were observed in both reports from treatment staff at the treatment unit and youth self-reports. We also found marginally significant ($p < 0.10$) increased prosociality and decreases in conduct problems reported by the youth, both with small effect sizes.

At the 18-month follow-up (T5), attrition was high (54%); therefore we analyzed only trajectories over five time points (T1, T2, T3, T4, and T5) for the primary outcomes of depression and anxiety and the primary process outcome PF. None of the outcomes reached statistical significance at a $p < 0.05$ level. However, the TAU+ACT group continued to move in the right direction compared to TAU, with small effect sizes. Effect sizes favoring TAU+ACT at 18-month follow-up were Cohen's d =.39 for depression, d =.34 for anxiety, and d =.44 for PF.

4.3.4 Limitations and strengths

Limitations in this study include the following:

- All outcomes are based on self-reports by youth or staff. Objective measures would have strengthened the study (e.g., recidivism in crime, unemployment, health care consumption measured by official registers).
- Attrition was high at the 18-month follow-up.
- We conducted only a minor adherence check (youth reports from what was covered in session two) and did not check whether the interventions were delivered in a highly competent way.
- This was not a randomized controlled trial; we used quasi-experimental design, which introduces a number of potentially confounding variables.
- The control group was not perfectly matched; at the start the controls had more self-reported disruptive behavior and fewer staff-reported conduct problems, and controls were on average one year older then in the TAU+ACT group (17.8 versus 16.8 years).

- We know that 90% of the youth in TAU began different forms of formal treatment (besides being placed in an inpatient treatment home); however, we did not manage to gather enough precise data to see whether the treatment time in TAU was equal with the addition of the ACT intervention in the TAU+ACT condition.
- The effects in favor of the addition of ACT were medium to small, and we did not do a formal investigation to see if those effects were clinically relevant.

There are also strengths with this study; for example, we found that the addition of this short ACT group intervention can be of help for youth in residential care, even when delivered by low-specialized treatment staff such as regular ward staff. We know that the TAU group was an active comparison; 90% of the youth in TAU started a formal treatment, and many of those treatments were effective CBT treatments (e.g., dialectic behavioral therapy or DBT, aggression replacement training or ART, and relapse prevention). The study was designed to include long-term follow-up at 18 months, and the measuring at five time points allows for both trajectory analyses and a possibility to establish a timeline to fulfill the criteria for mediation analyses. We tested the intervention at five different sites, with both boys and girls, and in different types of units (locked units, treatment units, acute placement units, and units specialized in assessing different diagnoses); this adds to the possibility of generalizing the findings. We had acceptable attrition: at post-treatment we assessed 84% of the participants. Since the formal testing of the psychometric properties of the AFQ-Y8 was conducted on this sample (Paper II), we can be assured of its psychometric properties in this sample. Finally, this study adds to the existing literature that supports PF as a meditational process for youth mental health problems.

5 GENERAL DISCUSSION

The overall aim of this thesis was to develop and test two transdiagnostic group treatments for two different populations of youth with mental health problems of differing severity. One aim was to test the interventions under real-world conditions when delivered by less-specialized staff; another was to start understanding possible mechanisms of change in those interventions by examining the construct of PF.

5.1 MAIN FINDINGS

Study I covers two studies on the same short ACT group intervention but for different forms of presenting problems in two different countries. This was a test of the interventions transdiagnostic properties; that is, would a general ACT intervention reduce stress among youth (Swedish study, 32 participants) and reduce symptoms of depression (Australian study, 66 participants)? The answer is affirmative. Compared to individual care by the school nurse, the youth who received the ACT intervention in the Swedish study reported significantly lower levels of stress, the effect size was large (Cohen's $d = 1.20$, $p = 0.009$). They also reported marginally significant decrease of anxiety with a large effect size (Cohen's $d = 0.80$, $p = 0.057$), and marginally significant increased mindfulness skills with a medium effect size (Cohen's $d = 0.75$, $p = 0.067$). In the Australian study, effects in favor of the participants in the ACT intervention as compared to the control group were significant reductions in depressive symptoms, and the effect size was large (Cohen's $d = 0.86$, $p = 0.008$). They also reported significant increased PF with a medium effect (Cohen's $d = 0.73$, $p = 0.021$).

Study II tested the psychometric properties of the Avoidance and Fusion Questionnaire for Youth (AFQ-Y). This questionnaire is designed to measure the construct of psychological flexibility (or its opposite, psychological *in*flexibility) that is central in ACT since it is a construct that is supposed explain why treatments work, or be a predictor of mental health, or mental health problems. Overall our results confirmed the reliability and validity of AFQ-Y with regards to measuring the construct of PF. Again, the AFQ-Y comes in two versions, AFQ-Y17 (17 items) and AFQ-Y8 (8 items). We also examined psychometric properties of AFQ-Y8. Our conclusion is to recommend the use of AFQ-Y8 because it is shorter and theoretically more sound (shows better fit to a single-factor structure as hypostatized).

Study III covers testing of the effectiveness of a short transdiagnostic ACT group intervention for youth with comorbid problems in residential care. The study was conducted at eight different psychiatric units within the NBIC. We included 160 adolescents (ages 15 through 20) with psychosocial problems who had been mandated to inpatient care within the NBIC; 91 youth at five sites received an addition of a 12-hour ACT group intervention on top of TAU (TAU+ACT), and the remaining 69 youth at three matched sites received only TAU. The ACT intervention was delivered by regular ward staff without formal psychotherapeutic training. We measured participants at five time points over an 18-month period. Compared to the control group (TAU), youth who received an addition of the short ACT group intervention (TAU+ACT) showed several beneficial improvements in our intention-to-treat

(ITT) analyses. After the intervention (T4), the TAU+ACT group had decreased symptoms on the primary outcome variables of depression (Cohen's $d = 0.34$, $p = 0.041$) and anxiety (Cohen's $d = 0.38$, $p = 0.003$), with small effect sizes. Decreased anxiety was to a large extent mediated by the primary process variable PF. For the secondary outcomes, the TAU+ACT group compared to TAU showed significant decreases in peer problems and hyperactivity and were found to have better overall psychosocial functioning, with medium to small effect sizes. Improvements regarding fewer peer problems and better psychosocial functioning were observed in both reports from treatment staff at the treatment unit and youth self-reports. We also found marginally significant ($p < 0.10$) increased prosociality and decreases in conduct problems reported by the youth, both with small effect sizes. At the 18-month follow-up (T5) attrition was high (54%), therefore we only analyzed trajectories over five time points (T1, T2, T3, T4 and T5) for the primary outcomes of depression, anxiety and the primary process outcome PF. None of the outcomes reached statistical significance at a $p < 0.05$ level. However the TAU+ACT continued to move in the right direction compared to TAU with small effect sizes. Effect sizes favoring TAU+ACT at 18-month follow-up were Cohen's d =.39 for depression, d =.34 for anxiety and d =.44 for psychological flexibility.

5.2 FEASIBILITY AND UTILITY OF ACT AS EARLY INTERVENTION FOR IMPROVING YOUTH MENTAL HEALTH (STUDY I)

The interventions in both Sweden and Australia was tested under real-world conditions in schools when delivered by less-specialized staff (e.g., students and counselors) with short training in ACT (two to four days). In both studies covering two slightly different cultural contexts (Sweden and Australia), attendance at the sessions was high, there were low dropout rates, and qualitative reports was almost unanimously positive. This indicates the feasibility of the intervention. The significant large decreases in depression and stress and the marginally significant large decrease in anxiety following this transdiagnostic ACT intervention indicate the utility of the intervention.

5.3 FEASIBILITY AND UTILITY OF ACT FOR INPATIENT USE WITH COMORBID MENTAL HEALTH PROBLEMS (STUDY III)

The ACT intervention was tested under real-world conditions at five different psychiatric units within the NBIC when delivered by less-specialized staff (i.e., regular ward staff without formal psychotherapeutic training). Attendance at the sessions were high; the most common reason for dropping out from the ACT intervention was that the youth was transferred to another setting (e.g., another treatment home or back to family). Anecdotal reports include that youth who have transferred to another setting before the ACT intervention was finished have been nagging to get the facilitators to come to the new setting and deliver the rest of the intervention (this has also happened), and youth have been asking for more ACT when the 12–hour intervention came to an end. Before the full-scale study we conducted two pilot-testings and collected qualitative data in the form of written and oral evaluations from participating youth and the group leaders to see if they were satisfied with the program and if there was something they did not like or that bothered them. Overall, both

youth and staff liked the intervention a lot. In the pilot within NBIC, after they had conducted the first intervention for youth at their unit, we asked the ACT facilitators the direct question, "What do you think about the potential of this method to be of benefit for youth within NBIC?" They were asked to grade their answer from 0 (not beneficial) to 5 (very beneficial), and the facilitators gave the ACT treatment an average score of 4.5. Taken together, this indicates the feasibility of the intervention.

The significant decreases at post-intervention compared to the control group on the primary outcomes of depression and anxiety, plus positive results on five of the secondary outcomes following this transdiagnostic ACT intervention, indicate the utility of the intervention.

5.4 MEDIATION

As stressed by several research teams, we need to start understanding by which mechanisms effective treatments work (Holmes et al., 2018; Kazdin, 2009). ACT has a clear, elaborated and testable theory, and has identified promising constructs (e.g., PF) that can be manipulated and induce positive outcomes. And in ACT, measures that can capture the targeted construct has been constructed (e.g AAQ-II for adults and AFQ-Y8 for children and youth). In Study I we assessed changes in PF before and after the ACT interventions. In the Australian study we observed a large reduction of the primary outcome of depression and a significant increase of PF, with a medium effect size. In the Swedish study we observed a large reduction of the primary outcome of stress, but did not find a statistically significant increase of PF. Looking at raw scores of changes of PF in the Swedish study, we can see that the ACT group moved in the right direction: the ACT group had a 13% increase of PF compared to 5% increase of PF in the control group. The combined findings for PF in Study I support my conclusions that PF is an important transdiagnostical construct for understanding mechanisms leading to youth mental health problems, and that we can increase levels of PF by using ACT. There are three plausible reasons (among many) for the nonsignificant changes to PF in the Swedish study. First, the study was too underpowered to detect increased PF. We included 32 youth but would have needed 150 youth to attain a power of 0.85, with $p < .05$ to find a moderate effect size (Cohen's $d = 0.5$). Second, it may be that AFQ-Y is not sensitive enough when it comes to detecting changes in PF; this might be especially true for AFQ-Y17, which we used in the Swedish study. AFQ-Y17 has been shown to have a poorer fit to a one-factor structure then AFQ-Y8 (Greco et al., 2008; Livheim et al., 2016; Valdivia-Salas et al., 2017). And according to theory AFQ-Y should fit a one-factor structure. The third and last reason could be that the Swedish intervention just did not affect levels of PF. However, my reasoning makes me believe in a combination of reason 1 (the study was underpowered) and reason 2 (AFQ-Y17 does not have ideal psychometric properties). However, I allow myself a great deal of speculation here. We cannot draw large conclusions on the role of PF from Study I because that study was not designed to be able to establish a timeline (to see whether changes in the mediator, in this case PF, come before outcome), and no formal tests were done to see whether PF mediated outcomes of the two primary outcomes of stress and depression.

In Study II we did a formal test and first replication on youth of an instrument designed to measure PF among youth, namely AFQ-Y. We found the instrument to have adequate psychometric properties, and we suggest the use of AFQ-Y8 compared to using AFQ-Y17. The shorter 8-item version is preferred as it is a better fit to a one-factor structure and it is preferable to have a shorter instrument, especially if one wants to assess potential mediators, because the recommendations are to do regular assessments of the mediator (and outcome), preferably at every session (Holmes et al., 2018).

In Study III we did the first—to my knowledge—study of ACT for youth where we designed the study to be able to measure PF as a mediator of outcome by following the recommendations for mediation analysis (Kazdin, 2009). To follow the recommendations, we assessed both mediator and primary outcomes at five time points and used a valid and reliable measure (AFQ-Y8) for the mediator. In Study II we concluded that AFQ-Y8 was a valid and reliable measure in this precise population. The results of the mediation analysis in Study III were, indeed, that the improvements of decreased anxiety at post-measurement (T4) in the TAU+ACT group were to a large extent mediated by the improvements in PF.

To check whether improved psychological flexibility happened before decreases in depression and anxiety (to establish the timeline), we built regression models and checked all five time points to see when PF, depression, and anxiety "kicked in" as statistically significant. We found that there was indeed statistically significant ($p = .009$) improvement of PF two weeks after the start of the ACT intervention (T2), and the decreased depression did not become statistically significant ($p = .020$) until after the end of the ACT intervention (three months after start, T4). We also checked anxiety in the same manner and found that two weeks after the start of the ACT intervention (T2) decreased anxiety also became statistically significant ($p = .024$); this effect disappeared when measuring four weeks into the study (T3) and then decreased anxiety became statistically significant again ($p = .019$) after the end of the ACT intervention (three moths after start, T4). So both improved PF and deceased anxiety was present two weeks after the start of the ACT intervention, which means that we cannot draw the conclusion that improved PF came before deceased anxiety.

We could not confirm that the decrease in depression in the TAU+ACT group was mediated by PF. However, compared to the control group there was a marginally significant improvement of PF in the TAU+ACT group, with a small effect size (Cohen's $d = 0.41$, $p = 0.055$). The three most probable reasons for not finding that PF mediated decreases in depression are that (a) the study was underpowered, or (b) another unknown mediator mediated the results, or (c) the AFQ-Y has some problems with discriminant validity and measures more general psychological distress that is closer to anxiety then depression. This has been a critique about AAQ-II (the adult measure of PF) raised by Wolgast (2014) and Tyndall et al. (2018). I will not speculate about which of those three reasons is the most plausible; instead I leave that question open for future research to investigate. Finding mechanisms of change and constructs that mediate outcome is not done in a single study; it is a collaborative effort in which patterns are found in several studies and, ideally, across

different research disciplines (e.g., genetic, epigenetic, neuro-inflammation, epidemiological, psychological, and sociological research). And I suggest that studies I, II, and III, described in this thesis, add to that common pool of knowledge, and that it is worthwhile to continue to examine the role of PF as a mechanism of change with the promise to enhance mental health and decrease mental health problems, and a relevant process to target in intervention studies among youth.

5.5 LIMITATIONS

As always, even if the results appear promising, they should be interpreted bearing limitations in mind. When describing the three studies I through III in section 4, I have made an extensive list of limitations for each of the three studies.

Study I:

For Study I there is a list of 13 limitations (under 4.1.4. Limitations and strengths) that I find relevant. Since they already are listed, I will not list them here again. Instead, I want to take a broader perspective. To consider large-scale implementation of the ACT intervention tested in Study I, I would like to see another study that replicates those positive findings. And I would find it useful if such a study was conducted by another group of researchers and that such a study addressed some of the more important limitations in our study by doing formal checks of mediators (including establishing a timeline), using a dose-equivalent attention-control group or an active control with same length. Such a study would also benefit from calculations of cost-effectiveness of the intervention.

Study II:

For Study II there is a list of three limitations (under 4.2.4. Limitations and strengths) that I find relevant. The most important limitation in my view is that it might be difficult to generalize the results to nonclinical populations, since the whole sample used consisted of youth with psychosocial problems that had been mandated to inpatient care. There is a Swedish replication of this study (Cederberg et al., 2018); however, that sample consisted of children and youth with cancer and therefore also can be difficult to generalize to nonclinical populations.

Study III:

For Study III there is a list of eight limitations (under 4.3.4. Limitations and strengths) that I find relevant. Similarly as for Study I, to consider large-scale implementation of the ACT intervention tested in Study III, I would like to see another study that replicates those positive findings. And I would find it useful if such a study was conducted by another group of researchers and addressed some of the more important limitations in our study by using a randomized controlled design, checking facilitators' adherence and competence, and using an active control (or attention control group) with same length of intervention. Such a study would also benefit from testing whether effects that stem from the ACT intervention are clinically relevant and whether the intervention is cost-effective.

5.6 ETHICAL CONSIDERATIONS

The three clinical studies included in this thesis has all been approved by ethical review boards.

In Study I, the Swedish study was approved of by the local ethical review board in Stockholm and the Australian study was approved by the local ethical review board in Melbourne, Victoria. Before inclusion in the two studies, all participants gave their written informed consent, and written parental consent was received. To minimize the risk of stigmatizing the participants, in Sweden we advertised the intervention as stress management training. Given that we have followed procedures approved by ethical review boards and complied with the stipulations of the Declaration of Helsinki (World Medical Association, 2010), I consider those studies fairly unproblematic from an ethical perspective. A minor ethical consideration is problems with power. Given the pilot nature of the Swedish and Australian studies, the samples were rather small and underpowered from a statistical point of view. This is not ideal from an ethical point of view either, since we are using time from youth for a study with too few participants to be able to answer the research questions it was set up to answer. This is a bit of dilemma when delivering interventions in schools, especially stress management interventions. A common problem is that youth who are stressed often are too stressed to participate in a stress management intervention after school hours. This also was the case in the Swedish study: we screened and invited 247 students, and at the end only 32 were included; many were interested but declined, referring to their being too stressed. Therefore I see an argument for giving interventions to promote mental health as universal prevention, preferably woven into a school curriculum.

Study III raises many ethical considerations because the participants are youth with severe problems who have been sentenced to care. The participants were youth who often had severe and comorbid mental health problems and had been sentenced to closed institutional care at residential treatment homes run by the NBIC. Compared to the general population, youth admitted to NBIC have increased exposure to child abuse, including drug abuse, sexual abuse, and parental psychopathology (Ybrandt & Nordqvist, 2015). Both the pilot study and the quasi-experimental multicenter study described in Study III were approved by the local ethical review board in Stockholm. One issue we discussed at length with the ethical review board was whether written parental/caregiver consent should be collected before including youth ages 15 through 18. We mutually concluded we would not collect written parental consent. The main argument for skipping written parental consent was that this would probably exclude youth who came from the most dysfunctional backgrounds. In many NBIC units, there were just enough time to squeeze in the ACT intervention before the placement ended for a given youth; this meant that if the youth needed to wait for parents' or caregivers' written parental consent they might have missed the opportunity to partake in the ACT intervention or the study, and this risk would be especially salient for youth who came from the most dysfunctional backgrounds.

When conducting Study III, we of course followed procedures that have been approved by ethical review boards and complied with the stipulations of the Declaration of Helsinki (World Medical Association, 2010). And some measures that we took to protect participating youth are worth highlighting. We chose to designate a test administrator at each of the eight sites. This person was not directly involved in treating the youth, and we paid for the test administrators to come to Stockholm for a one-day training in how to present oral and written information about the study to participants before they provided informed consent. They were also trained in how to administer the measures used in the study and how to relate to sensitive information that the youth might disclose when answering the questionnaires (e.g., self-reported delinquency, use of alcohol and drugs). It was stressed that information that youth had disclosed in relation to the study should never affect decisions about the youth (e.g., choice of treatments, length of placements, or furlough). In most cases, adolescents answered the questionnaire themselves and placed them in a sealed envelope that was sent directly to the researchers.

Another ethical consideration is the act of giving group interventions in residential care. One risks is for "deviancy training" or "peer contagion," which refers to peer learning and peer reinforcement of deviant behaviors and delinquency (Dodge, Dishion, & Lansford, 2006). However, this risk is present just from being in residential care. Another risk with group interventions in residential care is that personal information disclosed in the group can be used against a person. To minimize the risks of deviancy training or misuse of personal information, the intervention was designed in such a way that although participants worked with deeply personal subjects (e.g., values, struggles in life), for those subjects they mostly used paper and pen, and they were regularly reminded to disclose personal information only at a level they were comfortable with. It was also stressed that they were free to opt out of exercises (or the study, or the ACT intervention) at any time. Having a clear and user-friendly protocol also guided the facilitators to stick to the program and not drift into unspecified "group therapy." Other precautionary steps taken before the large quasi-experimental, multicenter study were the two pilot tests: in the first pilot in schools, we did a small randomized trial to see if the intervention produced any effects, and the results were promising. In both the first pilot and the second pilot within NBIC we also collected qualitative data in the form of written and oral evaluations from participating youth and the group leaders to see if they were satisfied with the program and if there was something they did not like or that bothered them. Overall both youth and staff liked the intervention a lot. There was only one negative finding, and that was from one unit in the NBIC pilot. Youth at this unit had been sentenced to long treatments (one to four years) for serious violent crimes, and they preferred the ACT intervention individually or in groups no larger than two persons. Therefore this was addressed in the full scale study.

5.7 CLINICAL IMPLICATIONS

Stress, depression, and anxiety make up the bulk of mental health problems among youth, and they often overlap. For example, approximately 65% of school-aged youth with

depression also have at least one comorbid disorder (Maughan et al., 2013). And approximately 10% show two or more overlaps. Overlaps between depression and anxiety are most common, and stress is present in all mental health problems. Therefore it is valuable to find transdiagnostic interventions with high feasibility and utility that can be delivered by less-specialized staff with quality. Considering the fine results, the ACT interventions described in Study I and Study III holds such promises. The results also imply that both interventions can be delivered by less-specialized staff with brief training in how to deliver it.

The transdiagnostic ACT intervention "ACT Experiential Adolescent Group" (Hayes and Rowse, 2008) described in Study I can be used before a person develops mental health problems to such an extent that she or he fulfills the criteria for a diagnosis. To intervene early by strengthening mental health and helping persons who have not yet received a diagnosis could reduce the incidence and onset of mental disorders as well as shorten episodes of illness and increase quality of life. According to the staging model described in Figure 1 (in section 2.2, A model for understanding and treating mental health problems), I would use this intervention for youth with nonspecific mental distress (Stage 1a) and for youth with a subsyndromal or subthreshold symptom profile (Stage 1b). The ACT intervention can be delivered in schools for students at risk or at youth centers (Ungdomsmottagningar).

I am currently training facilitators to deliver the intervention in both those settings. The protocol used in Study I was developed 10 years ago; from clinical experience and findings from other studies conducted on ACT we have refined ways of increasing PF. Therefore I use an updated protocol when training facilitators in this intervention.

The transdiagnostic ACT intervention "ACT – Living life fully" (Livheim, n.d.) described in Study III can be used before a person develops mental health problems to such an extent that she or he fulfills the criteria for a diagnosis or for youth in residential care. According to the staging model described in Figure 1, I would use this intervention for youth with subsyndromal or subthreshold symptom profile (Stage 1b), or as an additional treatment for youth with full defined syndrome (Stage 2), youth with recurrent, persistent problems (Stage 3), and youth with treatment-resistant recurrent problems (Stage 4).

As a result of the effects found in Study III, the NBIC is currently implementing the ACT intervention "ACT – Living life fully" as one of their treatments, and they are including the intervention in their national guidelines. They have designated three of their psychologists to become in-house trainers of facilitators who can deliver the intervention within NBIC. I am currently involved as a consultant to help with the transfer of knowledge and help them build their own infrastructure for training new facilitators.

Other arenas where this intervention can be used include schools, child and youth psychiatry (Barn & Ungdomspsykiatri or BUP), and units that offer residential care. I am currently training facilitators to deliver the intervention in those settings. When training facilitators in "ACT – Living life fully" (the protocol used in Study III), we use an updated version. The

original protocol for "ACT – Living life fully" was developed eight years ago; since then we have refined ways of increasing PF. Therefore both I and the NBIC use an updated protocol that we have cocreated when training facilitators in this intervention.

There are also clinical implications from Study II. With this first replication on youth of the AFQ-Y (replicating the original study by Greco et al., 2008), together with an additional three studies (Cederberg et al., 2018; Szemenyei et al., 2018; Valdivia-Salas et al., 2017), we can be fairly confident that the AFQ-Y measures the construct of PF among youth in a reliable and valid fashion. This is useful if one wants to do measures of real-life treatments to see if PF is being increased. Using the shorter AFQ-Y8 also makes measuring less time-consuming; this is especially important when measuring a mediator that ideally should be assessed at each session (Holmes et al., 2018).

Personally, as mentioned earlier (under 5.5, Limitations), I would like to see well-conducted studies that replicate the findings in Studies I and III. That said, I see making those interventions available as a small contribution to narrowing the prevention gap, treatment gap, and quality gap.

5.8 FUTURE DIRECTIONS

Given the increasing mental health problems in youth, I would like to see more clinical research on ACT and other promising approaches at all different levels of mental health through the late stages of severe suffering (such as presented in the staging approach).

I also see a need for clinical research that examines the effects of clusters of interventions on both the societal and the individual level. It would be especially valuable if such orchestrated efforts were aimed as universal prevention before substantial disability sets in; several examples of interventions on both the societal and the individual level in early stages are given in section 2.3, How can we treat mental health problems among youth.

I attended a workshop on the writing of a PhD thesis with professor Joseph W. DePierre at KI. In that workshop he encouraged us to use the less stringent format of a thesis (as opposed to the writing of a scientific paper) to indulge in speculations about potential connections, causes, and new leads to solutions for problems in our field of research, so now I will indulge in this freedom.

A question that occupies my mind—one I often get when I'm out talking about mental health problems among youth—touches upon the Swedish enigma: *In Sweden youth have very good prerequisites for being happy; we have good free schooling, health care, low poverty, and so on; why then are mental health problems steadily on the rise for the last 25 years?* Apart from suggested causes like youth's poorer results in schools and increased youth unemployment, no one really knows. One important topic I think has been overlooked is how we humans are swimming in a "language stew," which can give us "thinky-pain" (a made-up term for pain created by our thinking, judgments, evaluations, etc.) and create stress, anxiety, depression, and other mental health problems. Four main ingredients are responsible for this

toxic cocktail of thinky-pain: (a) language, (b) arbitrarily applicable relational responding (AARR, a geeky RFT term; see Dymond et al., 2018), (c) the things that we as a species have evolved to find rewarding, and (d) our post-industrial knowledge society. I will unpack each of them, aiming to connect the dots.

Language: It has been suggested that we humans are the only species on the planet that deliberately kill ourselves. And what significant difference between humans and other animals can explain this? I would say it is language. And how did humans develop language? This is still an area of debate among scholars, so I will give just a short background, as this might be relevant to understand increasing mental health problems among youth. Imagine, some 50,000 to 150,000 years ago, a sudden mutation in the fat cells of the human brain that enabled a thickening of the cortex. Imagine that this cortex alteration enabled us to think in symbols. It seems that our ability for symbolic thinking is the cornerstone for language. This ability, normally first seen in human infants from around the age of 18 to 24 months, sets us apart from the rest of the animal kingdom as far as we know. With our symbolic thinking we were able to create language; this has helped us to evolve levels of cooperation not seen in any other primate, and has led to our being the most dominant species on this planet (for good and ill). Symbolic thinking gave us language, and language is what makes it possible for us to think, problem-solve, ruminate (I view thinking as a silent talking to ourselves that has become highly automated through many, many hours of training), and also develop a stable sense of self.

Arbitrarily applicable relational responding (AARR): This a term used in RFT; put very simplistically, it is the human ability to *arbitrarily* give meaning and value to objects and create meaning, coherence, and connections between objects. We can train other primates, like chimpanzees, to choose a stick that is longer then another stick if this correlates with their factual physical properties (i.e., one stick is actually longer). But humans quickly learn to prefer things based on value we arbitrarily have assigned to an object. Say we have a big coin that is worth $1 and a smaller coin worth $5; a kid pretty soon will prefer the smaller coin because it buys more candy, and this is a value we arbitrarily have given to that coin; the worth does not correspond to the factual physical properties of the coins (bigger and smaller). Once we have learned AARR, we can spontaneously combine and relate events from the present, past, and future, creating thinky-pain. For example: let's say I am about to give an important speech. I am really nervous. I have never given this speech in this kind of setting, but I remember how I messed up a less important speech some time ago and how embarrassed I felt. Just *thinking* about that makes me contact feelings of embarrassment in the now, and thinking about how messing up this speech now would be *worse than* the embarrassment I felt the last time exacerbates the feeling of embarrassment I'm contacting here and now. So I decide to cancel the speech. The immediate relief is great! But the long-term consequence is that cancelling the speech was not a move in a valued direction to me, and I feel bad.

What we as a species have evolved to find rewarding: To be able to promote mental health, we must ask ourselves a key question: "What kind of monkey are we? What kind of circumstances and situations have we evolved to like and find rewarding?" When it comes to mental health, I believe that four intrinsic reinforcers might be most important: belongingness, prosocial behaviors, perceived fairness, and sense of coherence. It seems we

humans share with other animals and organisms many preferences for what we find intrinsically reinforcing. We want to approach things that we are curious about, or things we find appealing (good food, situations where we experience ourselves as appreciated, a potential sex partner, a beautiful sight, etc.), and we want to flee or avoid situations or objects that we find aversive (a situation that may make us feel rejected, a snake, etc.). As a species, we humans have evolved to live and cooperate in groups; we are evolutionarily designed to be a flock species. So feeling that we belong, are part of a group, are being loved and appreciated, are all intrinsic reinforcers for us. This also makes prosocial behaviors (behaviors intended to benefit another) such as helping, sharing, and cooperating are intrinsically reinforcing for us. Another shared feature that is important for both humans and other primates is *fairness*. I find the TED Talk by Frans de Waal (2011) a striking illustration of this. In a video that went viral, he shows how he rewards the efforts of two capuchin monkeys who deliver stones to him. The monkeys, situated in adjacent glass cages, are rewarded with a piece of cucumber for each stone they give to him. Then he switches to giving one of the monkeys grapes as a reward (grapes are highly prized by the capuchins), and the monkey that continues to get cucumber gets really upset by this unfairness. It stops working, refuses the cucumber, and throws it at de Waal.

It seems, too, that coherence is intrinsically reinforcing to us (Villatte, Villatte, & Hayes, 2015); we want the world to make sense, we want our behaviors to be coherent with how we perceive ourselves and what we value as important. This can sometimes be helpful and sometimes not so helpful. It is helpful when we flexibly navigate the world to make our behaviors coherent with what we value (PF), and not so helpful when we make up stories about the world; for example, assigning fixed negative attributes to people of other ethnicities, sexual orientations, or religions, or refusing to do things that are important to us because that action is not coherent with our self-perception (i.e., *I cannot give that speech because I am a shy person*).

Our post-industrial knowledge society: Many of today's western societies are turning into post-industrial knowledge societies (in which a country's service sector generates more wealth than the manufacturing sector). In many ways, those changes bring us into direct conflict with how we have evolved to operate and thrive. This challenges us to find new ways of relating to the world. As discussed earlier, short-term stress is not a problem, but long-term stress can be detrimental to our health. And this can be a problem in today's information-dense society, where we are spending more time in our heads, swimming in the language stew, marinating in thoughts and information. More and more jobs are about processing large amounts of information and making decisions; we are taking in more information via smartphones. The human brain at birth is huge compared to those of other mammals; this is believed to be a result of the cognitive capacity needed to engage in social interplay within our community. A couple of hundred years ago our community probably consisted of around 25 individuals; today our social communities can consist of 1,000-plus people, including our contacts on social media. Handling this complexity takes a lot of cognitive effort. Spending more time in our heads brings several additional challenges. One is that we are built for activating resources for short-term stress—that is, surviving an encounter with a predator—and then resting and recovering. It was pretty obvious when the threat from the predator was over and we could recover (if we survived); however, today's threats are usually "thought

threats," like "I will never make it to the deadline!" "Mom is ill; what if she gets worse?" "What if the rent on my flat increases?" "Will this new situation at work make me unemployed?" "That comment I wrote on Facebook; was that rude? Will people hate me now?" It is not as obvious when thought threats are over. By ruminating, we can activate our physical stress response 24/7 just by thinking. Our brain is surprisingly bad at distinguishing between a real physical threat and a thought threat; our physiological responses to both are an activation of the physical stress-response.

When it comes to our intrinsic need and urge for belongingness and benefits from engaging in prosocial behaviors, I believe that our western societies' turn toward becoming more and more individualistic is a double-edged sword. Looking at the findings from the World Values Survey (n.d.), let's take Sweden as an example. Sweden stands out with extremely high scores on secular-rational values and self-expression values. Good things probably associated with such world views are that Swedes perceive that they have a free choice, a sense of individual agency, higher acceptance of different sexual orientations, and trust in outsiders—all perceptions that can contribute to a stronger sense of happiness. But the flip side of a strong focus on individualistic values can be a loss of the sense of belonging to a community, and the heavy burden of a too-great sense of individual agency; for example, *Making a grand life for myself is totally up to me, and if I fail it is all because of me!* And what is a "grand life"? Today's youth compare their "success" and living standards not just with their classmates and peers, but also with millions of youth around the globe via social media and other media. And we usually compare ourselves with people we perceive to be more successful and happier than we are, so we come out as losers. There's another potential downside of a too-heavy individualistic focus: it can create a focus on materialistic values and distance us from altruistic values. We can miss natural opportunities to engage in prosocial behaviors. I believe that prosocial behaviors are an antidote to stress and depression in part because prosocial behavior demands that we take another's perspective. And regular training in perspective taking is one cornerstone of developing empathy, and taking another's perspective is also a way of stepping out of rumination.

Another challenge in today's post-industrial knowledge societies might be a lack of belongingness, purpose, and long-term reinforcers due to the diminished influence of religions. I am not implying we should become more religious. I just believe that religion may have filled different functions psychologically that we might want to find other means of replacing. Looking at the role of religion and church in Sweden 100 years ago, I believe two important functions were that (a) belonging to church also meant belonging to a community, having shared goals, purpose, and meaning; and (b) religion gave us preestablished sets of values and rules to live by, and those gave stability as long-term reinforcers. I believe people lived by Christian values and rules partly by negative reinforcement (i.e., "I must do good to not go to hell!") and partly by positive reinforcement (i.e., "I feel good when doing good!"). I repeat: I do not mean to advocate for religion; I believe there are other ways of replacing the religious functions of establishing values and creating a sense of belonging. One definition of values in ACT is that they are totally freely chosen (as opposed to religion, in which they are dictated), but we need to take the time and sometimes get some guidance to choose what we value and what set of rules we want to live by, and to identify what we want to fill our lives with. If we do not do this, we risk living our lives mainly under short-term negative

reinforcement (avoidance; i.e., "I'll skip helping that person; I could feel embarrassed," or "I'll skip studying; it's too hard, I only feel stupid") or short-term positive reinforcement ("Wow! Getting high feels awesome!" or "I really get a kick from the attention I get on social media!").

There's another dilemma that I believe we need to face. I think that, unfortunately, we cannot build happiness and eliminate human suffering *just* by increasing living standards and eliminating social injustices. Yes, I do believe and hope that we shall continue to increase living standards and to eliminate social injustices and other forms of injustice and problems. And we need to bear in mind that as humans, we always relate to and compare fairness in the given context in which we operate. For example, when I meet youth from one of the wealthiest suburbs in Stockholm, where absolute poverty has been eliminated, several youths who come from middle-income families perceive themselves as really poor, because in their context they compare their living standards with several peers who come from the top 10% socioeconomic stratum in that neighborhood. And their suffering from perceived poverty is real. This is why I believe we need to keep an eye out not just for actual poverty, but also for relative poverty and income inequality. Another example is the fruits we now are reaping from long, hard work in Sweden on gender equality. Several gaps between the genders are slowly shrinking (i.e., income gaps, number of women in leading positions), but paradoxically, this makes the remaining gaps stand out more starkly, and those smaller gaps create as much real, subjective suffering as the greater gaps did before—because, again, all comparisons we make are contextual.

On the same topic of paradox, in a book on pain, the Swedish professor Karin Johannisson (2014) concludes "It wasn't until we could opt out of it, that the pain became unbearable." A hundred years ago, many people lived with chronic physical pain (just imagine toothache before modern dental care!); today most of us in the West are largely spared from physical pain in our lives. Paradoxically, this may have made us more sensitive to pain—thanks to our contextual comparisons.

Connecting the dots and suggesting solutions to be further tested in research:

When promoting youth mental health and understanding and treating youth mental health problems, we must weigh contextual factors, such as how being a language-abled species in a post-industrial knowledge society might give rise to new challenges for youth, given our evolutionary predispositions.

In this endeavor, I believe ACT, RFT, and the construct of PF offer important theory and tools for helping youth build their resilience, and they give us clues about how to understand and treat mental health problems. In the context of the challenges just detailed, here are some directions I would like to see in future research and future interventions:

- Interventions that include efforts to create safe and nurturing contexts for youth. As mentioned, this includes reducing bullying and creating warm, nurturing, and inclusive climates in schools, homes, and other important arenas where youth spend their time, thereby creating contexts that foster a sense of belongingness, perceived fairness, and a sense of coherence and purpose, and that encourage prosocial behaviors.

- Interventions that aim at balancing the double-edged sword of individualism; that draw on the benefits of youth having a free choice, strengthening a sense of individual agency and trust. And also helps to decrease the heavy burden of a too-great sense of individual agency and the stress from too many choices at an early age.
- Teaching youth life skills; for example:
    - Identify values and what we want to fill our lives with.
    - Encourage youth to explore life, to learn from firsthand experience what they value and hold as important in life.
    - Learn how to step out of our heads, both to contact natural reinforcers in the here and now and to stop activating our physical stress response by worrying and ruminating.
    - Learn and practice how to build and keep social, sexual, and romantic relationships.
    - Normalize that life hurts; that pain (both physical and psychological) is an inevitable part of life.
    - Find ways of recovery, to avoid negative consequences of long-term stress.
    - Learn to accept, open up, and acknowledge emotions, sensations, and urges without unnecessary struggle.
    - Gain problem-solving skills around stressors and the things in life that we can influence.
    - Identify how we can best take care ourselves in terms of exercise, diet, sleep habits, and so on.
- Another area that I find relevant and too often overlooked, which I believe is relevant for youth mental health, is our broader context: namely, the state of our planet. I meet many children and youth who are stressed, rightly concerned, and pessimistic about environmental destruction, risk of a nuclear war, and other societal problems. Interventions at this level can include:
    - Help youth see threats to our planet without getting overwhelmed, and encourage them to take action in different forms instead of resigning, withdrawing, and becoming apathetic.
    - Recognize that our ability to use language and do arbitrarily applicable relational responding (AARR) is both a blessing and a curse. The positive side is that chains of actions can be sparked by a symbolically produced distant goal, like world peace. The downside is that the information we get, and how we perceive the world, make us seek information that is coherent with our world view, and then we can arbitrarily choose reasons to motivate any actions. A really frightening scenario would be that a leader of a country comes up with arbitrarily chosen reasons to start a nuclear attack; those reasons could be perfectly reasonable *given his or her perception of the world* (although correct according to that person's logic, a nuclear war might not be beneficial for our planet at large). Accordingly, interventions on a global scale could include actions like these: (a) we need to protect freedom of speech, since the information we get shapes our world view; (b) we need to stop viewing the inhabitants of this planet as "us and them" and start

> viewing us all as one tribe with a mutual responsibility to take care of our planet if we are to survive; and (c) we need to start behaving globally as one tribe in ways that make youth rightfully optimistic about the future.

And stepping down to a less broad-context perspective, another area I find worthy of attention is understanding the mechanisms of change. If, for instance, PF is a central construct across different types of mental health problems, we ought to be able to describe the whole process, from construct to change. We need to describe a coherent, plausible process detailing precisely what the construct does, how it works, and how it leads to the outcome. To do this requires several approaches. I would like to see AFQ-Y included in big epidemiological data sets, to see how PF predicts various health outcomes and how natural fluctuations in PF affect various health outcomes. Additional research approaches are needed, such as studies that include PF as a potential mediator (along with competing mediators), and theory-driven research approaches that uncover the sequential steps of how PF leads to the outcome. To this end, I would like to see more research along the lines of the studies by Jensen et al. (2012) and Gloster et al. (2015). In the study by Jensen et al. they randomized clients suffering from chronic pain to either 12 weeks of ACT treatment or a waiting list, and assessed pressure-evoked pain via functional magnetic resonance imaging (fMRI) and self-report questionnaires before and after treatment. Compared to the wait-listed, those who got ACT rated that the intervention had improved their situation at large, and they reported less depression and anxiety. The fMRI scans before and after ACT treatment also confirmed that the treatment changed how the brain processed pain. After ACT treatment, the pain signals, cognitions, and emotions took another cerebral loop, and this led to better access to executive regions of the brain so that pain could be reappraised. Findings like this start to give us clues about mechanisms of change in psychological treatments.

In the study by Gloster, Gerlach, et al. (2015), they compared epigenetic changes (5-HTTLPR polymorphism) and PF before and after ACT-treatment. They found increased PF as well as positive epigenetic changes and a correlation between those two variables. They concluded with this suggestion: “The endophenotype psychological flexibility may help bridge genetic and psychological literatures” (p. 399).

I also would like to see future research on digital, stepped-care solutions for youth. Potential solutions range from the use of apps or websites to educating the public about mental health issues; digital tools can be used for screening, self-monitoring, early self-help without support, and, at later stages, online psychotherapy with support.

One area that I find very interesting is to create a fun and engaging digital game that trains PF among youth and measures the effects of the game. Later steps in such a project could be to use the gaming interface to assess deep phenotypes of mental health. And by using eye-tracking devices and artificial intelligence, in theory this could help in tailoring interventions to maximize each individual’s adaptive processes or ameliorate maladaptive cognitive processes. I have been involved in such a project for the past three years. It is costly, and difficult in many ways, but it bears really interesting potential.

6 CONCLUSIONS

ACT as a short transdiagnostic group treatment is effective in reducing youth stress, symptoms of depression, and possibly anxiety when tested under real-world conditions in schools and when delivered by less-specialized staff. To add a short transdiagnostic ACT group treatment to TAU for youth with comorbid problems in residential care is an effective way to reduce symptoms of depression and anxiety. The ACT treatment also produces other beneficial effects, such as fewer peer problems and hyperactivity and better overall psychosocial functioning. Increased PF mediated the reduction in anxiety. The AFQ-Y8 is a reliable, valid, and brief instrument for measuring PF among youth and has broad clinical and research utility.

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8 REFERENCES

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Andersson, G., Titov, N., Dear, B. F., Rozental, A., & Carlbring, P. (In press). Internet-delivered psychological treatments: From innovation to implementation. *World Psychiatry*.

Angold, A., & Rutter, M. (1992). The effects of age and pubertal status on depression in a large clinical sample. *Development and Psychopathology*, *4*, 5–28.

Arnsten, A. F. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. *Nature Reviews Neuroscience*, *10*(6), 410–22. doi:10.1038/nrn2648

A-Tjak, J.G.L., Davis, M. L., Morina, N., Powers, M. B., Smits, J.A.J., & Emmelkamp, P.M.G. (2015). A meta-analysis of the efficacy of acceptance and commitment therapy for clinically relevant mental and physical health problems. *Psychotherapy and Psychosomatics*, *84*(1), 30–36.

A-Tjak, J.G.L., Morina, N., Topper, M., & Emmelkamp, P.M.G. (2018). A randomized controlled trial in routine clinical practice comparing acceptance and commitment therapy with cognitive behavioral therapy for the treatment of major depressive disorder. *Psychotherapy and Psychosomatics*, *87*, 154–163. DOI: 10.1159/000486807

Bartley, M. (2006). *Capability and Resilience: Beating the odds*. London: University College London.

Bick, J., & Nelson, C. A. (2016). Early adverse experiences and the developing brain. *Neuropsychopharmacology*, *41*, 177–96.

Biglan, A. (2015). The nurture effect: How the science of human behavior can improve our lives and our world. Oakland, CA: New Harbinger.

Biörklund, E., & Wall, H. (2009). *Prevention av ökad stress, psykisk ohälsa och riskbruk av alkohol baserad på Acceptance and Commitment Therapy En randomiserad kontrollerad studie Institutionen för psykologi* (unpublished master's thesis, Uppsala University).

Birmaher, B., Ryan, N. D., Williamson, D. E., et al. (1996). Childhood and adolescent depression: A review of the past 10 years. Part 1. *Journal of the American Academy of Child and Adolescent Psychiatry*, *35***,** 1427–35.

Black, D. S., Milam, J., & Sussman, S. (2009). Sitting-meditation interventions among youth: A review of treatment efficacy. *Pediatrics*, *124*(3), e532–e541.

Blokzijl, R. (2005). Measuring acceptance-related constructs amongst youngsters: Evaluation of the Dutch willingness and action measure for children and adolescents (WAM-C/A) and the Avoidance and Fusion Questionnaire for Youth (AFQ-Y) (unpublished master's thesis, Sectie Development and Educational Psychology, Leiden University, The Netherlands).

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., . . . & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and

Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, *42*(4), 676–688.

Bor, W., Dean, A. J., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal of Psychiatr*y, *48*(7), 606–616. doi:10.1177/0004867414533834

Bränström, R., & Pachankis, J. E. (2018). Sexual orientation disparities in the co-occurrence of substance use and psychological distress: A national population-based study. *Social Psychiatry and Psychiatric Epidemiology*, *4*(53), 403–415.

Breen, G., et al. (2016). Translating genome-wide association findings into new therapeutics for psychiatry. *Nature Neuroscience*, *19*,1392–96.

Bremberg, S. (2015). Mental health problems are rising more in Swedish adolescents than in other Nordic countries and the Netherlands. *Acta Pædiatrica*. doi:10.1111/apa.13075

Bremberg, S., & Dalman, C. (2015). *Begrepp, mätmetoder och förekomst av psykisk hälsa, psykisk ohälsa och psykiatriska tillstånd hos barn och unga: En kunskapsöversikt*. Stockholm: Forte.

Burklund, L. J., Torre, J. B., Lieberman, M. D., Taylor, S. E., & Craske, M. G. (2017). Neural responses to social threat and predictors of cognitive behavioral therapy and acceptance and commitment therapy in social anxiety disorder. *Psychiatry Res*, *261*, 52–64.

Cacioppo, J. T., Cacioppo, S., Capitanio, J. P., & Cole, S. W. (2015). The neuro-endocrinology of social isolation. *Annual Review of Psychology*, *66*, 733–67. doi:10.1146/annurev-psych-010814-015240

CASEL. (2015). 2015 CASEL Guide: Effective social and emotional learning programs—Middle and high school edition. CASEL 2015 Guide- Effective SELprograms.pdf

Casier, A., Goubert, L., Gebhardt, W. A., De Baets, F., Van Aken, S., Matthys, D., & Crombez, G. (2013). Acceptance, well-being and goals in adolescents with chronic illness: A daily process analysis. *Psychology & Health*, *28*(11), 1337–1351.

Cederberg, J. T., Weineland, S., Dahl, J., & Ljungman, G. (2018). A preliminary validation of the Swedish short version of the Avoidance and Fusion Questionnaire for Youth (AFQ-Y8) for children and adolescents with cancer. *Journal of Contextual Behavioral Science*, *10*, 103–107.

Chisholm, D., Sweeny, K., Sheehan, P., Rasmussen, B., Smit, F., Cuijpers, P., & Saxena, S. (2016). Scaling-up treatment of depression and anxiety: A global return on investment analysis. *Lancet Psychiatry*, *3*, 415–24.

Ciarrochi, J., & Hayes, L. (2016). Mindfulness based social and emotional learning: A new approach to promoting positive development in young people. *Scan: The Journal for Educators*, *35*(1), 37.

Clarke, S., Kingston, J., James, K., Bolderston, H., & Remington, B. (2014). Acceptance and commitment therapy group for treatment-resistant participants: A randomized controlled trial. *Journal of Contextual Behavioral Science*, *3*, 179–188. http://dx.doi.org/10.1016/j.jcbs.2014.04.005

Copeland, W. E., Shanahan, L., Costello, E. J., & Angold, A.(2009). Childhood and adolescent psychiatric disorders as predictors of young adult disorders. *Archives of General Psychiatry*, *66*, 764–772.

Crede, M., Tynan, M., & Harms, P. (2016). Much ado about grit: A meta-analytic synthesis of the grit literature. *Journal of Personality and Social Psychology*, *113*(3), 492–511. doi:10.1037/pspp0000102. PMID 27845531

Cuijpers, P., Sijbrandij, M., Koole, S. L., Andersson, G., Beekman, A. T., & Reynolds, C. F. 3rd. (2013). The efficacy of psychotherapy and pharmacotherapy in treating depressive and anxiety disorders: A meta-analysis of direct comparisons. *World Psychiatry*, *12*, 137–48.

Das-Munshi, J., Goldberg, D., Bebbington, P. E., et al. (2008). Public health significance of mixed anxiety and depression: Beyond current classification. *British Journal of Psychiatry*, *192*, 171–77.

Davidson, R. J., & McEwen, B. S. (2012). Social influences on neuroplasticity: Stress and interventions to promote well-being. *Nature Neuroscience*, *15*(5), 689–95. doi:10.1038/nn.3093

Davies, S. K., Ang, J. E., Revell, V. L., Holmes, B., Mann, A., Robertson, F. P., . . . & Skene, D. J. (2014). Effect of sleep deprivation on the human metabolome. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(29), 10761–6. doi:10.1073/pnas.1402663111

Demyttenaere, K., Bruffaerts, R., Posada-Villa, J., et al. (2004). Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization. World Mental Health Surveys. *JAMA*, *291*, 2581–90.

De Ridder, K.A.A., Pape, K., Cuypers, K., Johnsen, R., Holmen, T. L., Westin, S., & Bjørngaard, J. H. (2013). High school dropout and long-term sickness and disability in young adulthood: A prospective propensity score stratified cohort study (the Young-HUNT study). *BMC Public Health*, *13*(941).

de Waal, F. (2011. Moral behavior in animals. https://www.ted.com/talks/frans_de_waal_do_animals_have_morals

Dey, M., Jorm, A. F., & Mackinnon, A. J. (2015, March 14). Cross-sectional time trends in psychological and somatic health complaints among adolescents: A structural equation modelling analysis of "Health Behaviour in School-aged Children" data from Switzerland. *Social Psychiatry and Psychiatric Epidemiology 50*, 1189–1198. doi:10.1007/s00127-015-1040-3

Dodge, K. A., Dishion, T. J., & Lansford, J. E. (Eds.). (2006). *Deviant peer influences in programs for youth: Problems and solutions*. New York, NY: Guilford. doi:10.1016/j.beth.2012.05.003

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, *92*(6), 1087–1101. doi:10.1037/0022-3514.92.6.1087

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405–432.

Dusek, J. A., Out, H. H., Wohlhueter, A. L., Bhasin, M., Zerbini, L. F., Joseph, M. G., . . . Libermann, T. A. (2008). Genomic counter-stress changes induced by the relaxation response. *PLOS ONE*, *2;3*(7), e2576. doi:10.1371/journal.pone.0002576

Dymond, S., Bennett, M., Boyle, S., Roche, B., & Schlund, M. (2018). Related to anxiety: Arbitrarily applicable relational responding and experimental psychopathology research on fear and avoidance. *Perspectives on Behavior Science*, *41*(1), 189–213.

Egger, H. L., & Angold, A. (2006). Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *Journal of Child Psychology and Psychiatry*, *47*(3-4), 313–337.

Eisenberger, N. I., & Cole, S. W. (2012). Social neuroscience and health: Neurophysiological mechanisms linking social ties with physical health. *Nature Neuroscience*, *15*(5), 669–74. doi:10.1038/nn.3086

Erskine, H. E., Moffitt, T. E., Copeland, W. E., Costello, E. J., Ferrari, A. J., Patton, G., . . . Scott, J. G. (2015). A heavy burden on young minds: The global burden of mental and substance use disorders in children and youth. *Psychological Medicine*, *45*, 1551–1563.

Fergus, T. A., Valentiner, D. P., Gillen, M. J., Hiraoka, R., Twohig, M. P., Abramowitz, J. S., & McGrath, P. B. (2012). Assessing psychological inflexibility: The psychometric properties of the Avoidance and Fusion Questionnaire for Youth in two adult samples. *Psychological Assessment*, *24*(2), 402.

Flaxman, P. E., & Bond, F. W. (2010). A randomised worksite comparison of acceptance and commitment therapy and stress inoculation training. *Behaviour Research and Therapy*, *48*(8), 816–820.

Folkhälsomyndigheten. (2014). *Skolbarns hälsovanor i Sverige 2013/14*.

Folkhälsomyndigheten. (2018). *Varför har den psykiska ohälsan ökat bland barn och unga i Sverige? Utvecklingen under perioden 1985–-2014. Artikelnummer: 18023-2*

Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology*, *50*(3), 571–579.

FORTE. (2018). Hälsa och livsvillkor bland unga HBTQ-personer: Vad vet vi och vilka forskningsbehov finns? Forte – Forskningsrådet för hälsa, arbetsliv och välfärd. ISBN: 978-91-88561-14-5

Galvao, T. F., Silva, M. T., Zimmermann, I. R., Souza, K. M., Martins, S. S., & Pereira, M. G. (2014). Pubertal timing in girls and depression: A systematic review. *Journal of Affective Disorders*, *155*, 13–19.

Gloster, A. T., Gerlach, A. L., Hamm, A., Höfler, M., Alpers, G. W., Kircher, T., . . . Reif, A. (2015). 5HTT is associated with the phenotype psychological flexibility: Results from a randomized clinical trial. *European Archives of Psychiatry and Clinical Neuroscience*, *265*(5), 399–406.

Gloster, A. T., Meyer, A. H., & Lieb, R. (2017). Psychological flexibility as a malleable public health target: Evidence from a representative sample. *Journal of Contextual Behavioral Science*, *6*(2), 166–171.

Gloster, A. T., Sonntag, R., Hoyer, J., Meyer, A. H., Heinze, S., Strohle, A., & Wittchen, H.U. (2015). Treating treatment-resistant patients with panic disorder and agoraphobia using psychotherapy: A randomized controlled switching trial. *Psychotherapy and Psychosomatics*, *84*, 100–109. http://dx.doi.org/10.1159/000370162

Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and adolescence: Development and evaluation of the Avoidance and Fusion Questionnaire for Youth. *Psychological Assessment*, *20*(2), 93.

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A metaanalysis. *Journal of Psychosomatic Research*, *57*(1), 35–43.

Hacker, T., Stone, P., & MacBeth, A. (2016). Acceptance and commitment therapy - Do we know enough? Cumulative and sequential meta-analyses of randomized controlled trials. *Journal of Affective Disorders*, *190*, 551–565. doi:10.1016/j.jad.2015.10.053

Hains, A. B., Vu, M.A.T., Maciejewski, P. K., van Dyck, C. H., Gottron, M., & Arnsten, A. F. (2009). Inhibition of protein kinase C signaling protects prefrontal cortex dendritic spines and cognition from the effects of chronic stress. *PNAS*, *106*(42), 17957–17962. pnas-0908563106.

Halliburton, A, E., & Cooper, L. D. (2015). Applications and adaptations of acceptance and commitment therapy (ACT) for adolescents. *Journal of Contextual Behavioral Science*.

Hatch, L. (2011). The American Psychological Association Task Force on the sexualization of girls: A review, update and commentary. *Sexual Addiction & Compulsivity*, *18*(4), 195–211. doi:10.1080/10720162.2011.613326

Hayes, S. C., Barnes-Holmes, D., & Wilson, K. G. (2012). Contextual behavioral science: Creating a science more adequate to the challenge of the human condition. *Journal of Contextual Behavioral Science*, *1*, 1–16.

Hayes, L. L., Boyd, C. P., & Sewell, J. (2011). Acceptance and commitment therapy for the treatment of adolescent depression: A pilot study in a psychiatric outpatient setting. *Mindfulness*, *2*, 86–94.

Hayes, L. L., & Rowse, J. (2008). Acceptance and commitment therapy: Experiential adolescent group. Retrieved from Association for Contextual Behavioral Science website: http://contextualpsychology.org/treatment_protocols

Hayes, S. (n.d.). State of the ACT evidence. Association for Contextual Behavioral Science (ACBS). https://contextualscience.org/state_of_the_act_evidence

Hayes, S. C., Louma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behavior Research and Therapy*, *44*(1), 1–25.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change.* New York, NY: Guilford.

Henriksson, M., Nyberg, J., Schiöler, L., Hensing, G., Kuhn, G. H., Söderberg, M., . . . Åberg, M. (2018). Cause-specific mortality in Swedish males diagnosed with non-

psychotic mental disorders in late adolescence: A prospective population-based study. *Journal of Epidemiology and Community Health*, *72*(7), 582–588.

Hetrick, S., Merry, S., McKenzie, J., Sindahl, P., & Proctor, M. (2007). Selective serotonin reuptake inhibitors (SSRIs) for depressive disorders in children and adolescents. Cochrane Database Syst Rev. 2007; 3:CD004851. [PubMed: 17636776]

Hofer, P. D., Waadt, M., Aschwanden, R., Milidou, M., Acker, J., Meyer, A. H., . . . Gloster, A. T. (2018). Self-help for stress and burnout without therapist contact: An online randomised controlled trial. *Work & Stress*, *32*(2), 189–208.

Holmes, E. A., Ghaderi, A., Harmer, C. J., Ramchandani, P. G., Cuijpers, P., Morrison, A. P., . . . Moulds, M. L. (2018). The *Lancet Psychiatry* Commission on psychological treatments research in tomorrow's science. *Lancet Psychiatry*, *5*(3), 237–286.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLOS Medicine*, *7*(7). doi:10.1371/journal.pmed.1000316

Homlong, L., Rosvold, E. O., Bruusgaard, D., Lien, L., Sagatun, A., & Haavet, O. R. (2015). A prospective population-based study of health complaints in adolescence and use of social welfare benefits in young adulthood. *Scandinavian Journal of Public Health*, *43,* 629–637.

Ishizu, K., Shimoda, Y., & Ohtsuki, T. (2013). Developing the scale regarding psychological inflexibility in Japanese early adolescence. In a poster presented at 30th Annual Pacific Rim International Conference on Disability and Diversity, Honolulu.

Jellesma, F. C., & Cornelis, J. (2012). Mind magic: A pilot study of preventive mind-body stress reduction in behaviorally inhibited and activated children. *Journal of Holistic Nursing*, *30*(1), 55–62.

Jensen, K. B., Kosek, E., Wicksell, R., Kemani, M., Olsson, G., Merle, J. V., . . . Ingvar, M. (2012). Cognitive behavioral therapy increases pain-evoked activation of the prefrontal cortex in patients with fibromyalgia. *Pain*, *153*(7), 1495–1503.

Johannisson, K. (2014). *Kroppens tunna skal: sex essäer om kropp, historia och kultur*. Norstedts.

Jorm, A. F., Patten, S. B., Brugha, T. S., & Mojtabai, R. (2017). Has increased provision of treatment reduced the prevalence of common mental disorders? Review of the evidence from four countries. *World Psychiatry*, *16*, 90–99.

Kabat-Zinn, J., & Hanh, T. N. (2009). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Penguin Random House.

Kashdan, T., B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, *30*, 467–480.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, *3*, 1–27.

Kazdin, A. E. (2009). Understanding how and why psychotherapy leads to change. *Psychotherapy Research*, *19*(4-5), 418–428.

Kellam, S. G., Mackenzie, A. C., Brown, C. H., Poduska, J. M., Wang, W., Petras, H., & Wilcox, H. C. (2011). The good behavior game and the future of prevention and treatment. *Addiction Science & Clinical Practice*, *6*(1), 73–84.

Kendler, K. S. (2014). DSM issues: Incorporation of biological tests, avoidance of reification, and an approach to the "box canyon problem." *American Journal of Psychiatry*, *171*, 1248–50.

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., . . . Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *British Journal of Psychiatr*y, *197*, 378–85.

Kim, S.H.C.E.J. (2016). Psychological inflexibility in Korean children and adolescents: Validation of the Korean version of the Avoidance and Fusion Questionnaire for Youth-Eight Item Type (K-AFQ-Y8). *Korean Journal of Clinical Psycholog*y, *35*(3), 600–614.

Kohn, R., Saxena, S., Levav, I., & Saraceno, B. (2004). The treatment gap in mental health care. *Bulletin of the World Health Organization*, *82*, 858–866.

Kovacs, M., Feinberg, T. L., Crousenovak, M. A., Paulauskas, S. L., & Finkelstein, R. (1984). Depressive-disorders in childhood. 1. A longitudinal prospective-study of characteristics and recovery. *Archives of General Psychiatry*, *41*(3), 229–237. doi:10.1001/archpsyc.1984.01790140019002

Larson, R., & Asmussen, L. (1991). Anger, worry, and hurt in early adolescence: An enlarging world of negative emotions. In M. E. Colten & S. Gore (Eds.), *Adolescent stress: Causes and consequences* (pp. 21–41). New York: Aldine de Gruyter.

Levin, M. E., Hildebrandt, M. J., Lillis, J., & Hayes, S. C. (2012). The impact of treatment components suggested by the psychological flexibility model: A meta-analysis of laboratory-based component studies. *Behavior Therapy*, *43*(4), 741–756.

Livheim, F. (n.d.). Unpublished protocol for delivering an ACT intervention.

Livheim, F., Bond, F. W., Ek, D., & Hedensjo, B. S. (2018). *The mindfulness and acceptance workbook for stress reduction: Using acceptance and commitment therapy to manage stress, build resilience, and create the life you want*. Oakland, CA: New Harbinger.

Livheim, F., Hayes, L., Ghaderi, A., Magnusdottir, T., Högfeldt, A., Rowse, J., . . . Tengström, A. (2015). The effectiveness of acceptance and commitment therapy for adolescent mental health: Swedish and Australian pilot outcomes. *Journal of Child and Family Studies, 24*(4), 1016–1030. doi:10.1007/s10826-014-9912-9

Livheim, F., Tengström, A., Andersson, G., Dahl, J., Björck, C., & Rosendahl, I. (n.d.). A quasi-experimental, multicenter study of acceptance and commitment therapy for antisocial youth in residential care. Manuscript.

Livheim, F., Tengström, A., Bond, F. W., Andersson, G., Dahl, J., & Rosendahl, I. (2016). Psychometric properties of the Avoidance and Fusion Questionnaire for Youth: A psychological measure of psychological inflexibility in youth. *Journal of Contextual Behavioral Science*, *5*(2), 103–110.

Lønfeldt, N. N., Silverman, W. K., & Esbjørn, B. H. (2017). A systematic review and meta-analysis of the association between third-wave cognitive constructs and youth anxiety. *International Journal of Cognitive Therapy*, *10*(2), 115–137.

Lovallo, W.R. (2016). *Stress and health: Biological and psychological interaction* (3rd ed.). Los Angeles: SAGE.

Lundgren, T., Dahl, J., & Hayes, S. C. (2008). Evaluation of mediators of change in the treatment of epilepsy with acceptance and commitment therapy. *Journal of Behavioral Medicine*, *31*, 225–235. http://dx.doi.org/10.1007/s10865-008-9151-x.

Matthews, G., Deary, I. J., & Whiteman, M. C. (2003). *Personality traits*. Cambridge, England: Cambridge University Press. ISBN 9780521831079

Maughan, B., Collishaw, S., & Stringaris, A. (2013). Depression in childhood and adolescence. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, *22*(1), 35.

McEwen, B. S., et al. (2015). Mechanisms of stress in the brain. *Nature Neuroscience*, *18*(10), 1353–1363.

McGee, R., Feehan, M., Williams, S., Partridge, F., Silva, P., & Kelly, J. (1990). DSM-III disorders in a large sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, *29*(4), 611–619.

McGrath, J. J. (2006). Variations in the incidence of schizophrenia: Data versus dogma. *Schizophrenia Bulletin*, *32*, 195–97.

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, *129*, 674–697.

Moazzezi, M., Moghanloo, V. A., Moghanloo, R. A., & Pishvaei, M. (2015). Impact of acceptance and commitment therapy on perceived stress and special health self-efficacy in seven- to fifteen-year-old children with diabetes mellitus. *Iranian Journal of Psychiatry and Behavioral Sciences*, *9*(2).

Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. (2001). *Sex differences in antisocial behaviour*. Cambridge, England: Cambridge University Press.

Moffitt, T. E., Caspi, A., Taylor, A., Kokaua, J., Milne, B. J., Polanczyk, G., & Poulton, R. (2010). How common are common mental disorders? Evidence that lifetime prevalence rates are doubled by prospective versus retrospective ascertainment. *Psychological Medicine*, *40*, 899–909. doi:10.1017/S0033291709991036

Murphy, R., Cooper, Z., Hollon, S. D., & Fairburn, C. G. (2009). How do psychological treatments work? Investigating mediators of change. *Behaviour Research and Therapy*, *47*, 1–5.

Norell-Clarke, A., & Hagquist, C. (2017). Changes in sleep habits between 1985 and 2013 among children and adolescents in Sweden. *Scandinavian Journal of Public Health*, *45*(8), 869–877.

NREPP. (2011). *Acceptance and commitment therapy (ACT) intervention summary*. *Substance Abuse and Mental Health Services Administration's National Registry of Evidence-Based Programs and Practices*.

Owens, S. A., Helms, S. W., Rudolph, K. D., Hastings, P. D., Nock, M. K., & Prinstein, M. J. (2018). Interpersonal stress severity longitudinally predicts adolescent girls' depressive symptoms: The moderating role of subjective and HPA axis stress responses. *Journal of Abnormal Child Psychology*, 1–11.

Ozer, D. J., & Benet-Martínez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, *57*, 401–421.

Patel, V., Flisher, A. J., Hetrick, S., & McGorry, P. (2007). Mental health of young people: A global public-health challenge. *Lancet*, *369*, 1302–13.

Patel et al. (2018, October 9). The Lancet Commission on Global Mental Health and Sustainable Development. *Lancet*, *392*, 1553–98.

Petts, R. A., Duenas, J. A., & Gaynor, S. T. (2017). Acceptance and commitment therapy for adolescent depression: Application with a diverse and predominantly socioeconomically disadvantaged sample. *Journal of Contextual Behavioral Science*, *6*(2), 134–144.

Ponchel, F., & Burska, A. N. (2016). Epigenetic modifications: Are we closer to clinical applicability? *Journal of Pharmacogenomics & Pharmacoproteomics, 7***,** 158.

Potrebny, T., Wiium, N., & Moss-Iversen Lundegård, M. (2017). Temporal trends in adolescents' self-reported psychosomatic health complaints from 1980–2016: A systematic review and meta-analysis. *PLOS ONE*. https://doi.org/10.1371/journal.pone.0188374

Puolakanaho, A., Lappalainen, R., Lappalainen, P., Muotka, J. S., Hirvonen, R., Eklund, K. M., . . . Kiuru, N. (2018). Reducing stress and enhancing academic buoyancy among adolescents using a brief web-based program based on acceptance and commitment therapy: A randomized controlled trial. *Journal of Youth and Adolescence*, 1–19.

Purgato, M., Gross, A. L., Betancourt T., et al. (2018). Focused psychosocial interventions for children in low-resource humanitarian settings: A systematic review and individual participant data meta-analysis. *Lancet Global Health*, *6*, e390–400.

Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders*, *148*(1), 1–11.

Rew, L., Johnson, K., & Young, C. (2014). A systematic review of interventions to reduce stress in adolescence. *Issues in Mental Health Nursing*, *35*(11), 851–863.

Richter, L. M. (2006). Studying adolescence. *Science*, *312*, 1902–05.

Ristallo, A., Schweiger, M., Oppo, A., Pergolizzi, F., & Presti, G. (2015, July). ACT assessment with children and adolescents: The Italian version of AFQ-Y and CAMM. In XIII World Conference of Association for Contextual and Behavioral Sciences–ACBS (pp. 16–19).

Roberts, B. W., Jackson, J. J., Fayard, J. V., Edmonds, G., & Meints, J. (2009). Chapter 25. Conscientiousness. In M. R. Leary & Rick H. Hoyle (Eds.), *Handbook of Individual*

Differences in Social Behavior (pp. 257–273). New York/London: Guilford. ISBN 978-1-59385-647-2

Rudolph, K. D. (2002). Gender differences in emotional responses to interpersonal stress during adolescence. *Journal of Adolescent Health*, *30S*, 3–13.

Rudolph, K. D., Flynn, M., Abaied, J. L., Groot, A., & Thompson, R. (2009). Why is past depression the best predictor of future depression? Stress generation as a mechanism of depression continuity in girls. *Journal of Clinical Child & Adolescent Psychology*, *38*(4), 473–485.

Ruiz, F. J. (2012). Acceptance and commitment therapy versus traditional cognitive behavioral therapy: A systematic review and meta-analysis of current empirical evidence. *International Journal of Psychology and Psychological Therapy*, *12*(3), 333–357.

Rutter, M., & Smith, D. J. (Eds.). (1994). Psychosocial disorders in young people: Time trends and their causes. *International Journal of Social Psychiatry*, *42*(3), 238-242.

Savic, I., Perski, A., & Osika, W. (2017). MRI shows that exhaustion syndrome due to chronic occupational stress is associated with partially reversible cerebral changes. *Cerebral Cortex*, *28*(3), 894–906.

Schmalz, J. E., & Murrell, A. R. (2010). Measuring experiential avoidance in adults: The Avoidance and Fusion Questionnaire. *International Journal of Behavioral Consultation and Therapy*, *6*(3), 198.

Shackleton, N., Jama, F., Viner, R. M., Dickson, K., Patton, G., & Bonell, C. (2016). School-based interventions going beyond health education to promote adolescent health: systematic review of reviews. *The Journal of Adolescent Health*, *58*, 382–96.

Sharma, T., Guski, L. S., Freund, N., & Gøtzsche, P. C. (2016). Suicidality and aggression during antidepressant treatment: Systematic review and meta-analyses based on clinical study reports. *BMJ*, *352*, i65.

Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *JAMA*, *301*(21), 2252–9.

Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., & Gravesteijn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs: Do they enhance students' development in the area of skill, behavior, and adjustment? *Psychology in the Schools*, *49*(9), 892–909.

Slavich, G. M., & Irwin, M. R. (2014). From stress to inflammation and major depressive disorder: A social signal transduction theory of depression. *Psychological Bulletin, 140***,** 774–815.

Socialstyrelsen. (2013). *Tidiga insatser mot psykisk ohälsa hos små barn*.

Socialstyrelsen. (2017). *Utvecklingen av psykisk ohälsa bland barn och unga vuxna – Till och med 2016*. Artikelnummer 2017-12-29. Publicerad www.socialstyrelsen.se

Sonuga-Barke, E. J., et al. (2017). Child-to-adult neurodevelopmental and mental health trajectories after early life deprivation: The young adult follow-up of the

longitudinal English and Romanian adoptees study. *Lancet, pii*, S0140-6736(17)30045-4.

Spear, L. P. (2009). Heightened stress responsivity and emotional reactivity during pubertal maturation: Implications for psychopathology. *Development and Psychopathology*, *21*, 87–97.

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, *134*(1), 138–161. doi:10.1037/0033-2909.134.1.138. PMID 18193998

Stockings, E. A., Degenhardt, L., Dobbins, T., Lee, Y. Y., Erskine, H. E., Whiteford, H. A., & Patton, G. (2016). Preventing depression and anxiety in young people: A review of the joint efficacy of universal, selective and indicated prevention. *Psychological Medicine*, *46*, 11–26. doi:10.1017/S0033291715001725

Ströhle, A. M., Höfler, M., Pfister, H., Müller, A. G., Hoyer, J., Wittchen, H. U., & Lieb, R. (2007). Physical activity and prevalence and incidence of mental disorders in adolescents and young adults. *Psychological Medicine*, *37*(11), 1657–1666.

Sullivan, P. F., Daly, M. J., & O'Donovan, M. (2012). Genetic architectures of psychiatric disorders: The emerging picture and its implications. *Nature Reviews. Genetics*, *13*, 537–51.

Swain, J., Hancock, K., Dixon, A., & Bowman, J. (2015). Acceptance and commitment therapy for children: A systematic review of intervention studies. *Journal of Contextual Behavioral Scienc*e, *4*(2), 73–85. http://dx.doi.org/10.1016/j.jcbs.2015.02.001i

Szemenyei, E., Reinhardt, M., Szabó, E., Szabó, K. G., Urbán, R., Harvey, S. T., . . . Kökönyei, G. (2018). Measuring psychological inflexibility in children and adolescents: Evaluating the Avoidance and Fusion Questionnaire for Youth. *Assessment*, 1–11. doi:1073191118796558

Thapar, A., Collishaw, S., Pine, D. S., & Thapar, A. K. (2012). The sexualization of girls: A review, update and commentary. *Sexual Addiction and Compulsivity*, *18*, 195–211.

Törneke, N. (2010). Learning RFT: An introduction to relational frame theory and its clinical application. Oakland, CA: New Harbinger.

Tsatsoulis, A., & Fountoulakis, S. (2006). The protective role of exercise on stress system dysregulation and comorbidities. *Annals of the New York Academy of Sciences*, *1083*(1), 196–213.

Twenge, J. M., Gentile, B., DeWall, C. N., Ma, D., Lacefield, K., & Schurtz, D. R. (2010). Birth cohort increases in psychopathology among young Americans, 1938–2007: A cross-temporal meta-analysis of the MMPI. *Clinical Psychology Review, 30*(2), 145–154

Tyndall, I., Waldeck, D., Pancani, L., Whelan, R., Roche, B., & Dawson, D. L. (in press, 2018). The Acceptance and Action Questionnaire-II (AAQ-II) as a measure of experiential avoidance: Concerns over discriminant validity. *Journal of Contextual Behavioral Science*.

Ulrich-Lai, Y. M., & Herman, J. P. (2009). Neural regulation of endocrine and autonomic stress responses. *Nature Reviews Neuroscience*, *10*(6), 397–409. doi:10.1038/nrn2647. ISSN 1471-003X. PMC 4240627. PMID 19469025.

Valdivia-Salas, S., Martín-Albo, J., Zaldivar, P., Lombas, A. S., & Jiménez, T. I. (2017). Spanish validation of the Avoidance and Fusion Questionnaire for Youth (AFQ-Y). *Assessment*, *24*, 919–931. doi:10.1177/1073191116632338

Valero de Vicente, M., Ballester Brage, L., Orte Socías, M. C., & Amer Fernández, J. A. (2017). Meta-analysis of family-based selective prevention programs for drug consumption in adolescence. *Psicothema*, *29*, 299–305.

Vanaelst, B., et al. (2012). Prevalence of psychosomatic and emotional symptoms in European school-aged children and its relationship with childhood adversities: Results from the IDEFICS study. *European Child & Adolescent Psychiatry*, *21*(5), 253–265.

van Geelen, S. M., & Hagquist, C. (2016). Are the time trends in adolescent psychosomatic problems related to functional impairment in daily life? A 23-year study among 20,000 15–16 year olds in Sweden. *Journal of Psychosomatic Research*, *87*, 50–56.

Villatte, M., Villatte, J. L., & Hayes, S. C. (2015). *Mastering the clinical conversation: Language as intervention*. New York, NY: Guilford.

Vo, D. X., & Park, M. J. (2008). Stress and stress management among youth and young men. *American Journal of Men's Health*, *2*(4), 353–366.

Von Culin, K. R., Tsukayama, E., & Duckworth, A. L. (2014). Unpacking grit: Motivational correlates of perseverance and passion for long-term goals. *The Journal of Positive Psychology*, *9*(4), 306–312.

Walton, K. E., & Roberts, B. W. (2004). On the relationship between substance use and personality traits: Abstainers are not maladjusted. *Journal of Research in Personality*, *38*(6), 515–535.

Wasserman, D., Hoven, C. W., Wasserman, C., Wall, M., Eisenberg, R., Hadlaczky, G., . . . Bobes, J. (2015). School-based suicide prevention programmes: The SEYLE cluster-randomised, controlled trial. *Lancet*, *385*(9977), 1536–1544.

Wells, J., Barlow, J., & Stewart‐Brown, S. (2003). A systematic review of universal approaches to mental health promotion in schools. *Health Education*, *103*(4), 197–220. https://doi-org.proxy.kib.ki.se/10.1108/09654280310485546

West, P., & Sweeting, H. (2003). Fifteen, female and stressed: changing patterns of psychological distress over time. *Journal of Child Psychology and Psychiatry 44*(3), 399–411.

Wigtil, C. J., & Henriques, G. R. (2015). The relationship between intelligence and psychological well-being in incoming college students. *Psychology of Well-Being*, *5*(1), 4.

Wingo, A. P., Fani, N., Bradley, B., & Ressler, K. J. (2010). Psychological resilience and neurocognitive performance in a traumatized community sample. *Depression and Anxiety*, *27*(8), 768–774.

Wolgast, M. (2014). What does the Acceptance and Action Questionnaire (AAQ-II) really measure? *Behavior Therapy*, *45*(6), 831–839.

World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines.* Geneva: World Health Organization.

World Health Organization. (2005). WHO multicountry study on women's health and domestic violence against women. Geneva: World Health Organization.

World Health Organization. (2018). Mental health: Strengthening our response. World Health Organization. Retrieved from http://www.who.int/en/news-room/fact-sheets/detail/mental-health-strengthening-our-response

World Medical Association. (2010). The code of ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans; EU Directive 2010/63/EU,2015. Retrieved from http://www.wma.net/en/30publications/10policies/b3/index.html

World Values Survey. (n.d.). World Values Survey Association. https://en.wikipedia.org/wiki/World_Values_Survey

Xin, Z., Niu, J., & Chi, L. (2012). Birth cohort changes in Chinese adolescents' mental health. *International Journal of Psychology*, *47*(4), 287–295.

Ybrandt, H., & Nordqvist, S. (2015). *SiS-placerade ungdomars problematik i relation till andra ungdomar*. [Problems among youth placed within the NBIC in comparison with normal population.] Stockholm: Statens Institutionsstyrelse.

Zoogman, S., Goldberg, S. B., Hoyt, W. T., & Miller, L. (2015). Mindfulness interventions with youth: A meta-analysis. *Mindfulness*, *6*(2), 290–302.