

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Kiuru, Noona; Puolakanaho, Anne; Lappalainen, Päivi; Keinonen, Katariina; Mauno, Saija; Muotka, Joonas; Lappalainen, Raimo

Title: Effectiveness of a web-based acceptance and commitment therapy program for adolescent career preparation : A randomized controlled trial

Year: 2021

Version: Accepted version (Final draft)

Copyright: © 2021 Elsevier

Rights: CC BY-NC-ND 4.0

Rights url: <https://creativecommons.org/licenses/by-nc-nd/4.0/>

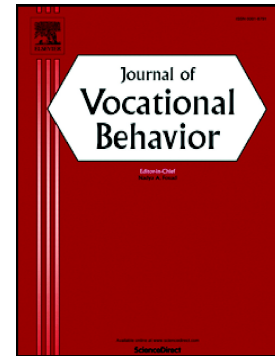
Please cite the original version:

Kiuru, N., Puolakanaho, A., Lappalainen, P., Keinonen, K., Mauno, S., Muotka, J., & Lappalainen, R. (2021). Effectiveness of a web-based acceptance and commitment therapy program for adolescent career preparation : A randomized controlled trial. *Journal of Vocational Behavior*, 127, Article 103578. <https://doi.org/10.1016/j.jvb.2021.103578>

Journal Pre-proof

Effectiveness of a web-based acceptance and commitment therapy program for adolescent career preparation: A randomized controlled trial

Noona Kiuru, Anne Puolakanaho, Päivi Lappalainen, Katariina Keinonen, Saija Mauno, Joonas Muotka, Raimo Lappalainen



PII: S0001-8791(21)00050-6
DOI: <https://doi.org/10.1016/j.jvb.2021.103578>
Reference: YJVBE 103578

To appear in: *Journal of Vocational Behavior*

Received date: 2 July 2020
Revised date: 30 March 2021
Accepted date: 2 April 2021

Please cite this article as: N. Kiuru, A. Puolakanaho, P. Lappalainen, et al., Effectiveness of a web-based acceptance and commitment therapy program for adolescent career preparation: A randomized controlled trial, *Journal of Vocational Behavior* (2021), <https://doi.org/10.1016/j.jvb.2021.103578>

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Running headline: WEB-BASED PSYCHOLOGICAL INTERVENTIONS AND ADOLESCENT CAREER PREPARATION

Effectiveness of a Web-Based Acceptance and Commitment Therapy Program for Adolescent Career Preparation: A Randomized Controlled Trial

Noona Kiuru^a, Anne Puolakanaho^a, Päivi Lappalainen^a, Katriina Keinonen, Saija Mauno^{a,b}, Joonas Muotka^a, and Raimo Lappalainen^a

^aDepartment of Psychology, University of Jyväskylä, Finland and ^bTampere University (Faculty of Social Sciences, psychology).

Conflict of Interest. The authors declare that they have no conflict of interest. **Ethical Approval.** This study was conducted in compliance with APA ethical standards. It was approved by the Ethical Committee of the University of Jyväskylä, and has been registered at ClinicalTrials.gov. **Informed Consent.** Informed consent was obtained from all the participants of the study. **Funding.** This study was funded by the Finnish Cultural Foundation and the Academy of Finland (No. 324638). **Data Sharing and Declaration.** The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Correspondence concerning this article should be addressed to Noona Kiuru, Department of Psychology, University of Jyväskylä, P.O. Box 35, 40014 Jyväskylä, Finland; E-mail: noona.h.kiuru@jyu.fi.

Running headline: WEB-BASED PSYCHOLOGICAL INTERVENTIONS AND ADOLESCENT
CAREER PREPARATION

Effectiveness of a Web-Based Acceptance and Commitment Therapy Program for Adolescent Career

Preparation: A Randomized Controlled Trial

3rd revision submitted 30th March 2021

2nd revision submitted 26th February 2021

1st revision submitted 10th November 2020

First submitted 2nd July 2020

Abstract

Acceptance and commitment therapy (ACT) programs have rarely been used as tools for promoting adolescents' career preparation. This randomized controlled trial examined the possibility to promote the career preparation of Finnish ninth-grade adolescents ($n = 249$, 49% females) with a web-based five-week ACT-based online intervention program. Participants were randomly assigned to three conditions, of which two groups received an iACT including support via SMS (iACTface: iACT+two face-to-face sessions; only iACT: iACT with no face-to-face sessions) and the third (control) group received no treatment. The results showed that career-related insecurity decreased as a result of the intervention irrespective of adolescent gender or academic achievement. Intervention effects in career-choice self-efficacy, in turn, were moderated by gender as such that girls benefited more from face-to-face support during intervention than boys. All the detected immediate effects were maintained at the six-month follow-up. In turn, delayed intervention effects in career-related insecurity and career-choice self-efficacy were mainly observed among adolescents with low academic achievement. The effect sizes of the found intervention effects were moderate. The results suggest that ACT-based online intervention programs have potential to promote adolescent career preparation. However, such interventions might be especially effective for subgroups of adolescents.

Keywords: adolescents; acceptance and commitment therapy (ACT); online interventions; career preparation

Introduction

Career preparation including clarifying vocational preferences and specifying and implementing educational choices is considered among the most important developmental tasks for adolescents (Super, 1980; 1990). The successful performance of this developmental task has been shown to promote personal growth, psychological and economic well-being, and vocational careers (Germeijs & Verschueren, 2017; Lent & Brown, 2013). Career preparation and career control might be particularly important nowadays when future career prospects are more insecure and unstable due to major changes occurring in working life (e.g., Briscoe, 2015; Guest & Rodrigues, 2015). Not only adolescents' goals, values and interests, but also self-efficacy and coping skills play a central role in their educational and vocational choices as well as in their future careers (e.g., Betz, 2007; Briscoe, 2015; Gainor, 2006; Lent, 2013).

Among adults, Acceptance and Commitment Therapy (ACT) interventions in an occupational context have been found to promote employees' job performance, productivity and innovation potential (Bond & Bunce, 2003; Bond et al., 2010), and reduce absenteeism as well as job burnout (Bond & Flaxman, 2006; Flaxman & Bond, 2010; Puolakanaho et al., 2018). In general, ACT interventions aim to support individuals' personal growth and resilience, with an emphasis on clarification of interests and values and acting in accordance with one's values (Hayes et al., 2006; Hoare et al., 2012). ACT also emphasizes building acceptance skills or a flexible behavioral repertoire in relation to one's own inner experiences (e.g. self-critical thoughts, anxiety; Hayes et al., 2006), which can increase adaptability and the ability to pursue long-term goals that, in turn, are related to career preparation (see Lent, 2013). According to Hoare et al. (2012), ACT has potential to offer a holistic approach to career development interventions and enhance individuals' cognitive and emotional functioning in regard to career planning. Thus, ACT-based interventions may also promote the goals of adolescent career preparation. However, no previous studies have examined the effectiveness of ACT interventions to promote adolescents' career preparation, which we focus on.

Specifically, our study focuses on the career preparation of 15- to 16-year-old Finnish adolescents in the ninth grade fall before they make critical educational choices regarding upper secondary education (i.e., vocational vs. academic track) after compulsory basic education. In Finland, this is the first milestone in transition from school to working life in adolescents' educational track. The aim of the current randomized controlled trial was to examine the effects of acceptance and values-based skill training during the five-week online ACT intervention program on ninth grade adolescents' career preparation, measured as career choice self-efficacy, career-related insecurity, and preparation against career setbacks. Additionally, the current study examined whether intervention efficacy was moderated by gender and academic achievement.

Acceptance and commitment therapy among adolescents

Acceptance and commitment therapy (ACT) is a so-called third wave, process-based cognitive behavioral therapy (Hayes et al., 2012a, Hayes et al., 2012b). ACT does not attempt to manipulate or change the form or the frequency of individual thoughts. Instead, it aims to alter the *function* that the thought, emotional reaction or behavior has. The aim of ACT is to create a "mind" that is more flexible and open to the new opportunities and more aware of consequences of actions (Hayes et al., 2012a, Hayes et al., 2012b). The ACT-model proposes that adolescents' ineffective actions or problems can be caused by entangled mind processes leading to poorly developed self-awareness, failure to see the perspective of others, and weak skills to pursue for one's own goals and solve challenging life events.

Psychological flexibility is a key concept in the ACT theory, referring to individuals' capability to focus on their current situation and, depending on the opportunities provided by the situation, to act towards achieving their personal goals and values, even in the presence of unwanted thoughts, emotions, physiological sensations and memories (Bond et al., 2008; Flaxman et al., 2013; Hayes et al., 2012a, Hayes et al., 2012b). Essentially, ACT intervention models focus on promoting six inter-related psychological processes: (a) remaining flexibly and purposefully in the present moment and being mindful of thoughts, feelings, bodily sensations, and action potentials; (b) maintaining a perspective-taking attitude on thoughts and emotional reactions; (c) clarifying one's hopes, values,

and goals in life; (d) acting in line with identified personal hopes, values, and goals; (e) willingly experiencing unwanted inner experiences to engage in valued action; and (f) observing and recognizing the thoughts that interfere with one's experienced life events and valued actions and seeing them as thoughts rather than literal truths (Flaxman et al., 2013; Hayes et al., 2012b; Authors, 2019). Each of these processes is a psychological skill that can be useful in planning one's own actions and committing to pursuing long-term goals (characterized in the current paper as career-related goals) as well as addressing possible barriers or setbacks (characterized in the current paper as career—related setbacks) including inner experiences that may function as barriers to action (e.g. self-doubt).

Essentially, ACT-based interventions are thought to be a process-based psychological treatments that potentially influence psychologically derived obstacles and challenges in multiple different life domains, including that of career (Dindo et al. 2017; Hayes et al., 2012a; Hayes & Hoffman 2017; Muto et al., 2011; Pistorello, 2013). A growing number of studies have successfully used the ACT approach with adolescents, for example, to alleviate depression and stress (e.g., Petts et al., 2017), to alter unwanted behavior (e.g., Armstrong et al., 2013), and to relieve physical conditions, such as pain (e.g., Wicksell et al., 2009). Furthermore, ACT-based interventions have shown positive effects in alleviating psychological symptoms, increasing quality of life, and enhancing psychological flexibility in adolescents (Authors, 2019, 2021; Swain et al., 2015) and in university students (e.g., Levin et al., 2017; Muto et al., 2011; Pistorello, 2013; Räsänen et al., 2016). Among adults ACT has also been found to enhance self-efficacy, performance, productivity and innovation potential in occupational settings (Flaxman et al., 2013). Current literature suggests that ACT may have the potential to promote school engagement and decrease the risk of adolescents dropping out of school (Moore et al., 2003). However, as far as we know, no previous studies have examined the efficacy of ACT in promoting adolescent's career preparation which we focus on in the current paper. In the present study career preparation was examined through career choice preparedness, including the readiness to take advantage of opportunities and the readiness to deal with barriers and setbacks in the domain of career choice (Koivisto et al., 2011; Sweeny et al., 2006; Vuori et al., 2008).

Adolescents' career preparation and acceptance and commitment therapy

Career development is a dynamic process that continues over the span of one's career (which encompasses much of the life span) and where the formation of career-related choices is particularly relevant and active during adolescence (Lent & Brown, 2013). Adolescents' high abilities to cope with career decisional tasks have been shown to predict their subsequent academic commitment and adjustment in higher education, which, in turn, has been associated with successful vocational careers (Germeijs & Verschueren, 2007; Keller & Whiston, 2008).

Lent (2013, see also Lent et al., 1994) launched an integrative social cognitive career theory (SCCT) to understand educational and occupational behavior. SCCT proposes that experiences of one's own skill development at young age shape career choice-related self-efficacy, expectations and interest and ultimately career development. Indeed, high career choice-related self-efficacy has shown to positively associate with career exploration (Brown & Lent, 2016; Creed et al., 2007), career persistence (Choi *ym.*, 2012; Lent et al., 1994) and promote actual career-related choices and performance (Betz & Hackett, 1981; Brown & Lent, 2016; Lent et al., 1993). Outcome expectations, e.g., experiences of career and labour market insecurity, in turn, have been shown to complement self-efficacy in the prediction of educational and vocational intentions (Fouad & Smith, 1996; Lent et al., 1993), educational choice goals (Lent et al., 2005), and impaired self-management (Alisic & Wiese, 2020). In SCCT, self-efficacy and outcome beliefs are seen as jointly influencing career-related interests, which tend to foster career choice goals (i.e., intentions to pursue a particular career path) that are congruent with one's interests (Lent, 2013; Lent et al., 1994).

Following this boosting self-efficacy beliefs and outcome expectations related to career preparation has become one of the most important proximal goals in career-related interventions (for reviews, see Betz, 2007; Gainor, 2006). Therefore, the present study focuses on adolescents' experienced career-choice self-efficacy and career-related insecurity (closely related to career outcome expectations) as key indicators of career preparation. As context factors (e.g. societal structures, feedback from others, media coverage etc.) can also influence career development (Lent, 2013; Lent et

al., 1994), it is important to develop competence to prepare for overcoming problems when facilitating career choices (Creed et al., 2007; Koivisto et al., 2011). Therefore, the present study focuses also on preparation against career setbacks as an indicator of career preparation.

Previous studies have provided evidence that various preventive interventions can be successful in increasing an adolescent's efficacy in making career decisions (Betz, 2007; Brown & Ryan Krane, 2000; Gainor, 2006; Koivisto et al., 2011). For example, Koivisto et al. (2011) showed for a community sample of youth that a one-week workshop program intervention successfully promoted ninth graders' career choice preparedness and positive attitude toward career planning. Web-based interventions to promote exploring career options and searching for career-related information have also been found to be useful tools in career counseling for adolescents and university students (Betz & Borgen, 2009; Fowkes & McWhirter, 2007; Tirpak, & Schuesser, 2013; Turner & Lapan, 2005).

However, most previous preventive interventions (for a review, see Lent, 2013) have been educational with the emphasis on promoting capabilities in information seeking, crystallizing vocational interests, and promoting effective career decision-making. Less attention has been paid to the role of psychological processes and emotional functioning in career preparation (Hoare et al., 2012; Kidd, 2004; 2008). An important part of ACT's potential contribution to career counseling and preventing career interventions is that it may enable counselors and clients to better address adolescents' interests (i.e., Brown, 2007), relationships (i.e., Schultheiss, 2003), and emotions (i.e., Kidd, 2004, 2008) as they pertain to the career-related issues (see also Hoare et al., 2012). The ACT model integrates psychological theories and practices as well as career counselling, offering a new model to understand career preparation and to identify the life domains in which adolescents are struggling to carry out valued activities, to recognize and tackle the obstacles related to emotional and cognitive barriers (Hoare et al., 2012).

As far as we know, no career interventions, based on ACT to promote adolescents' career preparation, have thus far been implemented. Since finding a purpose in life and obtaining flexibility and adaptation skills are particularly relevant aims for ensuring adolescents' successful careers (Bronk

et al., 2009; Burrow et al., 2010; Eccles, 2004; Hill et al., 2013; Savickas, 2005), it is arguably feasible to test the efficacy of ACT also in the promotion of adolescents' career preparation.

Adolescents' gender and academic achievement as moderators

Individuals may also differ in the extent to which they benefit from ACT interventions, implying that individual difference factors may moderate (weaken/strengthen) intervention outcomes. Even though little is thus far known about the factors that moderate the efficacy of ACT interventions, increasing understanding about such factors is important because it helps to improve the efficacy of interventions by tailoring intervention content to the needs of different individuals (Pots et al., 2016; Välimäki et al., 2017). In this intervention study, two potential moderating factors are considered: adolescent gender and academic achievement.

Poor academic achievement is related to more limited career options available and to a heightened need for making alternative plans if the primary educational choices are not realized. Hence, poor academic achievement may also hinder adolescents' career preparation, shown as lower self-efficacy in making career choices and increased experiences of career insecurity (see also Negru-Subtirica & Pop, 2016). Furthermore it has already been shown that youth career interventions are more effective among those who have learning difficulties (Vuori et al., 2008), which again might be linked with (poorer) academic achievement. These findings suggest that academic achievement may moderate the relationships between ACT intervention and career outcomes.

In previous studies, it has also been shown, somewhat paradoxically, that adolescent girls tend to outperform boys academically (Kiuru et al., 2007; Marcenaro-Gutierrez et al., 2017; Pomerantz et al., 2002) but at the same time are more vulnerable to school-related stress than boys (Currie et al., 2012; Hirvonen et al., 2019). In one previous study, the results showed that the efficacy of a web-based ACT intervention in alleviating adolescent stress and increasing their academic buoyancy did not depend on the level of adolescents' academic skills (Authors, 2019). However, no previous studies have examined whether adolescents' gender and academic achievement might moderate efficacy of ACT interventions to promote adolescent career preparation.

Current study and hypotheses

The goal of this study was to investigate the effects of the Youth Compass program (a web-based five-week ACT intervention) on career preparation i.e., career-choice self-efficacy, career-related insecurity, and preparation against career setbacks, among adolescents. A total of 249 ninth-grade adolescents were randomly assigned to three conditions of which two groups received an iACT including online support (iACTface: iACT + two face-to-face sessions; only iACT: iACT with no face-to-face sessions). These two iACT interventions were compared to a control group receiving only the usual support from the school. The following three research questions and hypotheses were addressed.

1) Can adolescents' career preparation be promoted with the web-based Youth Compass program, and does intervention efficacy vary between the two intervention groups (i.e., iACTface vs. only iACT)? It is expected (H1) that the Youth Compass program promotes adolescents' career preparation in terms of higher career-choice self-efficacy, lower career-related insecurity, and higher preparation against career setbacks (closely related to career outcome expectations). Due to inconsistent previous research, no hypotheses are set regarding differences between intervention groups (i.e., iACTface vs. only iACT).

2) Are the intervention results maintained at the six-month follow-up, and does maintenance of intervention effects vary between the two intervention groups (i.e., iACTface vs. only iACT)? It is expected (H2) that the positive intervention results persist at the six-month follow-up, indicating maintenance of intervention effects. Due to the lack of previous research, no hypotheses are nevertheless set regarding differences between intervention groups in the maintenance of intervention effects (i.e., i.e., iACTface vs. only iACT).

3) Is the efficacy of Youth Compass in promoting adolescent career preparation moderated by adolescent gender and academic achievement? Adolescents with lower achievement, who likely need especially much further career guidance and counseling (see also Pope, 2015), were tentatively expected (H3) to particularly benefit from Youth Compass with regard to their career preparation. Due

to the lack of previous research, no hypotheses are set regarding adolescent gender as a moderator of intervention effects. However, regarding practical implications it is important to find out whether girls and boys differentially benefit from the intervention.

Method

Participants and group protocols

The participant flow diagram is shown in Figure 1 and demographic characteristics are shown in Table 1 (for details of the study procedures, see Authors, 2019, 2021). The five-week interventions were carried out in the fall of the ninth grade (2017) before a transition to upper secondary school. A group-administered pre-measurement during regular school hours was carried out in the early fall of 2017 (September–October), post-measurement in the late fall of 2017 (October–November) and follow-up measurement in the spring of 2018 (March–April). The time interval between pre- and post-measurements was seven weeks and the time interval between pre- and follow-up measurements was six months.

Participants were randomized in the three groups: (1) iACTface group, receiving both face-to-face and online support ($n = 83$), (2) iACT group, receiving only online support ($n = 82$), and (3) control group, receiving no additional support ($n = 84$) (see also Authors, 2019, 2021).

The iACTface group. The participants in the iACTface group the web-delivered intervention program Youth Compass. Before the program, this group also had a face to-face meeting with their individually assigned coach, which consisted of a structured interview and discussion (45 min) about the adolescents' current life situation. The interview questions were shortened and adapted for the adolescents from a psychosocial interview template (Strosahl et al., 2012). These adolescents were also given oral instructions and an instructions sheet with credentials for the Youth Compass, which explained how to work in the web program and how and when to complete the weekly assignments. In a second face-to-face meeting, which followed the five-week intervention, the adolescents in this group were interviewed by the coach about their intervention experiences. During the five-week intervention, these adolescents had a short weekly contact with their coach via SMS messages.

The iACT group. The participants in the iACT group received the same web-based intervention program as those in the iACTface group. However, the iACT group participants had no individual face-to-face meetings with their coach. Instead, they received credentials and a brief introduction to the Youth Compass program, instructions, and an instructions sheet for the web program, along with a timetable for weekly assignments. The iACT group participants also had short weekly contact with their coach via instant text messages.

The control group. The control group was not provided with intervention resources or feedback. They (as well as the iACTface and iACT groups) only received normal support from the school, such as the possibility to liaise with school health professionals regarding psychological and other well-being issues or to receive personal support for learning difficulties.

The Youth Compass intervention program

Inspired by acceptance and commitment therapy (ACT) intervention models for adolescents (e.g., Ciarrochi et al., 2012; Hayes & Ciarrochi 2015) and experiences gained from a web-based ACT program targeted at university students (Kasänen et al., 2016), a novel Finnish five-week structured web-based intervention program called Youth Compass was developed (for a detailed description of the intervention program, see Authors, 2019, 2021). The Youth Compass intervention program consisted of five modules (one module per week), each of which present a different ACT-based theme as follows: (1) exploring personal values, interests and setting goals including career planning and career-related goals, (2) promoting awareness of self, skills of acceptance and skills to handle thoughts constructively (cognitive defusion), (3) being in the present, (4) self as context and self-compassion, and (5), applying important actions to social life and compassion towards others and integrating learnt skills into one's personal life (including acting according to own values).

In other words, the Youth Compass program devotes one intervention module to value work and related career-related issues and the rest of the four modules deal with exploring emotional and cognitive barriers to value-based actions and career-oriented goals, including mindfulness and practicing distance to difficult thoughts and emotions. Adolescents were, for example, encouraged to

reflect on important values and life goals – including career-oriented goals - and to choose concrete actions based on their values. Career-related exercises include, for instance, a video-based exercises *Hero of Your Own Life* and *Career planning*, encouraging the adolescents to reflect on and take actions related to their career path.

Each of the five modules was divided into an introduction and three sections containing exercises. To complete a module, the participant had to complete at least two exercises within each of the three sections, first exercise being mandatory and next could be chosen from a selection of four to seven exercises. Totally the participants were required to complete at the minimum 30 exercises. The program consists of short texts, pictures, video clips, comic strips, and audio-based exercises and could be accessed via computer or mobile device. Most of the exercises were offered in both written and audio-recorded form. Altogether, the intervention program included more than 90 exercises (for a full list of exercises, see Authors, 2019). On average, adolescents used the Youth Compass during 4.47 different weeks ($SD = 1.89$ weeks) and used 84.68 minutes ($SD = 62.20$ minutes) with program's exercises during the intervention.

Procedure

The Youth Compass intervention study was implemented as part of the broader Finnish longitudinal research project ($N = 800$) aiming to examine different individual and environmental factors that promote learning, well-being, and successful educational transitions. A subsample ($n = 249$) of students from the broader longitudinal study was allocated for randomized controlled trials for the Youth Compass intervention. Written consent for participation from both the adolescents and their parents was required for participation. The study has been evaluated and approved by the ethics committee of the institution [name blinded] and the intervention study was pre-registered in the [blinded] forum before its implementation.

Measures

Career preparation. Adolescents' career preparation in the pre-, post- and follow-up assessments was measured using three measures: (1) career choice self-efficacy, (2) career-related insecurity, and (3) preparation against career setbacks.

Career choice self-efficacy was measured with the Career Choice Self-Efficacy Scale (CCSES; Koivisto et al., 2011; see also Taylor & Betz, 1983) designed to assess self-efficacy beliefs related to career choice behaviors in the context of Finnish ninth graders who are planning the transition to post-compulsory education and making choices between academic and vocational educational tracks. Participants were asked to answer 11 questions on a 5-point scale (1 = very poorly to 5 = very well; e.g., Do you believe you are able to contact school counselors or teachers to obtain guidance and information on issues related to your prospective educational and work career? Do you believe you are able to choose the most personally suitable sector of education for yourself?). Cronbach's α coefficients for pre-, post- and follow-up measurements were .92, .91, and .90.

Career-related insecurity was measured with five questions adapted from the Finnish Youth Barometer (2017). Adolescents' were asked to evaluate their worries and expectations in relation to their future career prospects (e.g., insecurity). They were asked to answer on a five-point Likert scale (1 = not at all, 5 = very much) the extent to which they are worried about whether (1) they get into the aspired studying place/school/vocational field, (2) they complete their vocational studies, (3) they will be employed/have a career in the future, (4) their income level will be sufficient in the future, and (5) they fear being left outside of working life in the future. Cronbach's α coefficients for pre-, post- and follow-up measurements were .87, .89, and .88.

Preparedness for career setbacks (inoculation against setbacks; Koivisto et al., 2011) was assessed by four questions (e.g., Do you already have ideas or alternative plans for any possible setbacks you may face in your studies?) on a 5-point scale (1 = very few, 5 = very many). Cronbach's α coefficients for pre-, post- and follow-up measurements were .89, .89, and .88.

Moderators. Adolescent *gender* was coded as follows: 0 = girl and 1 = boy. Information on the students' overall *academic achievement* (as a grade-point average) was gathered using student

questionnaires. In Finnish schools, the grades range from 5 to 10, with 5 being the lowest accepted grade and 10 the highest. Self-reported school grades have been shown to correlate .86 with the actual grades from the school registers (see also Sainio et al., 2019).

Success of randomization, adherence, and attrition

First, we examined whether the three groups differed from each other in the initial stage of the study. No significant group differences were found prior to the intervention (see Table 1), suggesting that the randomization was successful.

Although 64 (79%) and 58 (73%) of adolescents in the iACTface and iACT groups met the adherence criterion, 38 adolescents (17 from the iACTface group and 21 from the iACT group) randomized in the intervention groups did not complete an acceptable number of tasks (at least three of the five intervention modules) during the intervention, hence failing to meet the adherence criterion (see also Authors, 2019). Next, we examined differences in the pre-measurement between the participants who did or did not meet the adherence criterion. No differences were found in any aspects of career preparation (i.e., career-choice self-efficacy, career-related insecurity, preparation against career setbacks) in the pre-measurement (*all ps* > .05). By contrast, in comparison to girls (12%) boys (35% were overrepresented among those who did not meet the adherence criteria ($\chi^2(1) = 11.46, p = .001, \text{Cramér's } V = 0.27$). In addition, academic achievement in the ninth-grade was higher among adolescents who met the adherence criteria ($M = 8.23, SD = 0.89$) than those who did not do so ($M = 7.40, SD = 0.88, t(149) = -3.55, d = 0.94$). No other differences in the pre-measurement were observed.

Analysis strategy

The intervention results were analyzed using two analytical options: intention-to-treat and per-protocol (Ranganathan et al., 2016; see also Authors, 2019). All the randomized participants who filled in the pre-questionnaire ($n = 243$; see flow chart in Figure 1) were included in the intention-to-treat protocol analyses (for the results, see Appendix 1). The per-protocol analyses that will be reported in more detail included the participants who fulfilled the adherence criterion (i.e., had fulfilled at least three of the five intervention modules; $n = 205$). We examined differences in the changes in different

aspects of career preparation in the three study groups (i.e., the within- and between-group differences as well as effect sizes). In addition, we investigated the possible moderation effects of gender and academic achievement on the outcomes of the intervention. Statistical analyses were conducted using Mplus (version 8, Muthén and Muthén, 1998–2020) including all the available data, with only a few missing values. Analyses were carried out with hierarchical linear modeling (HLM) with full-information maximum likelihood estimation. HLM accounts for missing values at random and includes all available data.

Effect sizes (ES) regarding changes from pre- to post-measurement and from post- to follow-up measurement were reported using Cohen's d and were calculated as follows: First, the within-group ES was calculated by subtracting the mean score of the pre/post-measurement from the mean scores of the post/follow-up measurement and dividing the score by the pooled standard deviation of the two conditions. Second, the corrected between-group ES were calculated by subtracting group difference in the pre/post-measurement phase from group difference in the post/follow-up- measurement phase and dividing it by the pooled standard deviation of the pre- measurement phase. A between-group ES of 0.20 was considered small, 0.50 moderate and above 0.80 large (Cohen, 1988).

Results

Intention-to-treat analyses

In the intention-to-treat analyses group differences in the changes in the career preparation indicators (i.e., career-choice self-efficacy, career-related insecurity, preparation against career setbacks) were examined using the whole randomized sample (intention-to-treat analyses). In the first analyses (Model 1), the intervention groups (i.e., iACTface and iACT) were contrasted with the control group. Changes in career preparation investigated both from pre- to post-measurement and from post- to follow-up measurement. In the second analyses (Model 2), gender was investigated as a possible moderator as such that also the main effects of gender and interaction terms of gender with intervention groups were added to Model 1. In the third analyses (Model 3), academic achievement was examined as a possible moderator as such that the main effects of achievement and interaction

terms of achievement with intervention groups were added to Model 1. The results of intention-to-treat analyses (Models 1, 2, and 3) are shown in supplementary material (Appendix 1, Stable 1). More detailed interpretations of the results are provided from the per-protocol analyses.

Per-protocol analyses

The main results of the current study are reported for those participants who successfully participated in the Youth Compass program and met the adherence criteria (per-protocol analyses, $n = 205$ in the three groups). Table 2 shows means and standard deviations for career preparation measures (i.e., career-choice self-efficacy, career-related insecurity and preparation against setbacks) for pre-, post-, and follow-up measurements in the iACTface, the iACT and the Control groups for all adolescents and separately for girls and boys. In turn, Table 3 shows HLM results of similar models of per-protocol analyses as described in the intention-to-treat analyses (for effect sizes, see Table 4). The results of per-protocol analyses were stronger but otherwise resembled those in the intention-to-treat analyses. Effect sizes of all the found intervention effects were small.

Model 1. In the first analyses (Model 1; Table 3) regarding between group differences in changes, the intervention groups (i.e. iACTface and iACT) were contrasted with the control group. Changes in career preparation were investigated both from pre- to post-measurement and from post- to follow-up measurement. The results (Table 3) showed one significant between-group difference with moderate effect size (Table 4) in changes of career preparation outcomes. The iACT group and control group significantly differed regarding the change in *career-related insecurity* from pre-measurement to post-measurement (Table 2). A decrease in career-related insecurity from pre- to post-measurement was found to be significant ($p = .012$) in the iACT group, while career-related insecurity did not significantly change within the control group ($p = .72$). The iACT group and the control group did not differ in changes from post- to follow-up measurements, suggesting maintenance of the intervention effect in career-related insecurity in the iACT group. In addition, although between-group change did not reach statistical significance ($p > .05$), a within-group change in career-choice self-efficacy from pre- to post-measurement was significant in the iACTface group ($p = .01$): For adolescents in this

group, career-choice self-efficacy increased from pre- to post-measurement (see also, Table 2). The within-group changes regarding career-choice self-efficacy in the iACT and intervention groups were non-significant ($p > .05$). No other intervention effects were observed. In addition, the intervention groups (iACTface vs. iACT) did not significantly differ in changes ($p > .05$) for any of the career preparation outcomes.

Model 2. In the second analyses (Model 2; Table 3), gender was investigated as a possible moderator by adding the main effects of gender and interaction terms of gender with intervention groups to the previous models (Model 1). The results showed that gender did not moderate intervention effects in relation to career-related insecurity and preparation against career setbacks. In contrast, the results for *career-choice self-efficacy* (Table 3) revealed two statistically significant interaction effects: gender moderated the intervention effect of iACTface group on changes from pre- to post-measurement and the intervention effect iACT group on changes from post- to follow-up-measurement.

Regarding the first interaction effect in career-choice self-efficacy, the results of follow-up analyses revealed that iACTface intervention was effective from pre- to post-measurement for girls ($p = .004$), but not for boys ($p = .28$). Among girls, the iACTface group and control group differed with moderate effect size (Table 4) regarding the change in career-choice self-efficacy from pre-measurement to post-measurement (Table 2). An increase in girls' career-choice self-efficacy from pre- to post-measurement was significant ($p = .001$) in the iACTface group, while career-choice self-efficacy did not change among girls in the control group ($p = .54$). In turn, girls in the iACTface and control groups did not differ in changes from post- to follow-up measurements, suggesting maintenance of the intervention effect in career-choice self-efficacy.

Regarding the second interaction effect in career-choice self-efficacy, the results of follow-up analyses revealed that the effect iACT group for changes from post- to follow-up measurement was significant with moderate effect size (Table 4) for boys ($p = .05$), but not for girls ($p = .85$). Whereas among boys no intervention effect of iACT group was observed from pre- to post-measurement, the

intervention effect of iACT group was significant among boys from post- to follow-up measurement. An increase in boys' career-choice self-efficacy from post- to follow-up measurement was significant ($p = .02$) in the iACT group, while career-choice self-efficacy did not change from post- to follow-up measurement within boys in the control group ($p = .99$).

Model 3. In the third analyses (Model 3; Table 3), academic achievement was examined as a possible moderator as such that the main effect of achievement and interaction terms of achievement with intervention groups were added to Model 1. The results (Table 3) showed, first, that achievement did not moderate intervention effects in preparation for career setbacks. However, although achievement did not moderate intervention effects from pre- to post-measurement, achievement-moderated intervention effects from post- to follow-up measurement in relation to both career-related insecurity and career-choice self-efficacy (Table 3). The follow-up analyses indicated that the effect iACT group for changes from post- to follow-up measurement was significant for both career-related insecurity ($p = .03$) and career-choice self-efficacy ($p = .01$) for adolescents with low academic achievement, while no similar effects were observed for adolescents with high academic achievement ($ps > .05$). The results showed that adolescents with low academic achievement particularly benefited from iACT from post- to follow-up measurement, shown as decreased career-related insecurity ($d = 0.64$) and increased career-choice self-efficacy ($d = 0.39$). By contrast, for adolescents with low achievement in the control group, career-related insecurity slightly increased and career-choice self-efficacy decreased, indicating a detrimental pattern of career preparation without iACT for low achievers.

Discussion

Programs based on acceptance and commitment therapy (ACT) have rarely been used as preventive tools for promoting adolescents' career preparation. This randomized controlled trial examined the possibility to promote adolescents' career preparation (i.e., career-choice self-efficacy, career-related insecurity, and preparation against career setbacks) with a web-delivered, five-week ACT-based intervention program among a general sample of ninth-grade adolescents. Preventive

career intervention was conducted in the ninth grade fall before adolescents make critical educational choices regarding upper secondary education (i.e., vocational vs. academic track). Hence, career planning and decision-making regarding upper secondary studies was topical for all the participants. ACT-based interventions are thought to have broad effects on individuals' successful careers including promoting of career preparation (Hoare et al., 2012). Participants were randomly assigned to three conditions, of which two groups received an iACT including support via SMS (iACTface: iACT + two face-to-face sessions; only iACT: iACT with no face-to-face sessions), whereas the control group did not receive any treatment.

The results showed that career-related insecurity decreased as a result of the intervention irrespective of adolescent gender or academic achievement. Intervention effects in career-choice self-efficacy, in turn, were moderated by gender as such that girls benefited more from face-to-face support during intervention than boys. All the detected immediate effects were maintained at the six-month follow-up. In turn, delayed intervention effects in career-related insecurity and career-choice self-efficacy were mainly observed among adolescents with low academic achievement. The effect sizes of the statistically significant intervention effects were moderate. Finally, no significant intervention effects (with negligible effect sizes) were found in preparation against career setbacks. The results suggest that ACT-based online intervention programs have the potential to promote adolescent career preparation. However, the respective interventions might be especially effective for certain subgroups of adolescents.

Intervention effects in career preparation for all adolescents

The results regarding the efficacy of the web-based Youth Compass program (iACT) were partly in line with Hypotheses 1 and 2. In support of H1 and H2, the results first revealed that as a result of the iACT intervention ninth-graders' experienced career-related insecurity significantly decreased and that the related intervention effect was maintained at the six-month follow-up. In addition, although between-group difference in the change of career-choice self-efficacy did not reach statistical significance, within-group increase in career-choice self-efficacy was significant in the iACTface

group and non-significant in the control group. These results suggest that web-based ACT programs may have the potential to promote adolescent career preparation (especially regarding career insecurity).

Many possible explanations might underlie these results. First, career-related insecurity and possible anxiety about career indecision may be related to adolescents' past learning experiences and critically loaded self-statements and negative feedback received from significant others (see also Hoare et al., 2012). Adolescents also actively follow various social media channels, where the changes and unpredictability of future working life are present. This might lead adolescents to question whether stable career prospects are even possible in a changing world full of uncertainty, hence increasing worrying and anxiety about the future. ACT entails using techniques to clarify one's life goals and change the function of cognition as well as to generate flexibility in the regulation of behavior and moving towards one's chosen life values (see also Hayes, 2004). Essential to clarifying one's life goals is finding a purpose. Purpose leads to behavioral consistency and influences both vocational and avocational decisions throughout one's life (McKnight & Kashdan, 2009). Many studies have shown that values and one's purpose in life have a strong influence on career choice, decision-making and satisfaction with and success in one's studies and chosen occupation (see also Brown, 2007; McKnight & Kashdan, 2009). As a result of clarified educational goals and values and improved well-being skills learned through ACT, adolescents' experienced career-related insecurity may decrease and their experiences of career-choice self-efficacy increase.

Nevertheless, the results for preparation against career-related setbacks did not support Hypotheses 1 and 2: no indication of effectiveness of iACT was obtained in this aspect of career preparation. In ACT, values are not defined as goals but chosen directions in life and from these chosen directions, concrete goals, specific daily behaviors, and potential barriers are defined (Hayes et al., 2004). Hence, an exploration of potential barriers, making alternative plans together with increased psychological flexibility is expected to support adolescents' coping resources and better prepare adolescents against setbacks in life. One explanation why no intervention results were found in

preparation against career-related setbacks among ninth grade adolescents is that in the Youth Compass program only limited attention was paid specifically to the career domain (i.e., career domain was one of the multiple life domains in focus). It is possible that increased preparation against career-related setbacks in the final grade of comprehensive education would have required more intensive working particularly in career planning and working with related alternative plans. Another possible explanation for lacking intervention results in preparation against career-related setbacks is the fact that the target group was young 15- to 16-year-old adolescents. Because these adolescents, preparing for their educational and vocational career, are still in the final year of compulsory comprehensive education, they have experienced only a few career-related setbacks during their compulsory school career. This might relate to less variation and individual differences in career-related setbacks (compared to that in experienced career-related insecurity and career-choice self-efficacy) and hence to smaller intervention effects.

Gender as a moderator of efficacy

Our next aim was to examine whether the efficacy of the web-based Youth Compass program (iACT) in promoting adolescent career preparation was moderated by gender. Due to the lack of previous research in this area, no hypotheses were set regarding adolescent gender as a moderator. The results showed, first, that gender did not moderate intervention effects in career-related insecurity and preparation against career setbacks, suggesting that in these career preparation outcomes efficacy is not dependent on adolescent gender. In turn, the results for *career-choice self-efficacy* (Table 3) revealed two statistically significant interaction effects. The results revealed that iACTface intervention (iACT + two face-to-face sessions) was effective in promoting career-choice self-efficacy only for girls, but not for boys. An intervention effect among girls was also maintained at the six-month follow-up. Furthermore, although no immediate intervention effects on career-choice self-efficacy were observed among boys, the intervention effect of iACT (iACT with no face-to-face sessions) regarding increased career-choice self-efficacy was detected among boys from post- to follow-up measurement, suggesting delayed intervention effect among boys. Previous studies have shown ACT interventions to be

successful in increasing adults' general self-efficacy (Afshar, 2016; Khashouei et al., 2016) and health-related self-efficacy among adolescents who have type 1 diabetes (Moazzezi et al., 2015). Our results suggest that web-based ACT interventions have the potential to promote adolescents' career-choice self-efficacy, although intervention effects seem to depend on adolescent gender.

Many previous studies have shown that the quality of client–therapist relations and therapeutic alliance play a significant role in therapy outcomes (Agnew-Davies et al., 1998; Ardito & Rabellino, 2011; Whiston et al., 2016). In our study, the amount of face-to-face support was minimal: only one 45-minute session at the beginning and another 45-minute session at the end of the five-week intervention. All the adolescents participating in the intervention received online support via SMS. One possible explanation why minimal face-to-face support had additional value only for girls (and not for boys) may relate to girls' better interpersonal skills (Gavin & Fuhrman, 1989; Tan et al., 2018), which allowed them to more deeply connect with their coach during a short face-to-face time. Another possible explanation why web-based intervention (without face-to-face contact) was more effective for boys than for girls relates to the fact that boys more actively play different interactive videogames than girls (Desai et al., 2010), perhaps making only web-contact during the intervention more natural and comfortable for boys. The third possible explanation for the results is the fact that a great majority of coaches (87%) were young females. Some studies have shown that forming close and trusting relationships with a therapist of a gender other than one's own can sometimes be more challenging (Sprenkle et al., 2009). It is possible that adolescent girls more easily connected with female coaches than adolescent boys did. In our study, the number of male coaches was too small to enable an investigation of the impact of the gender of the coach on intervention results. Overall, these explanations are speculative, since to our knowledge this study is the first to examine the efficacy of iACT to promote adolescents' career preparation. It is also notable that the above-described gender difference in intervention efficacy was observed only in one out of three career preparation outcomes. Further studies are needed to shed light on these mechanisms in more detail.

Academic achievement as a moderator of efficacy

Finally, we also examined whether the efficacy of the web-based Youth Compass program (iACT) in promoting adolescent career preparation was moderated by adolescent academic achievement. We tentatively expected (Hypothesis 3) that adolescents with low achievement, who especially much need of further career counseling (see also Pope, 2015), would particularly benefit from Youth Compass with regard to their career preparation. The results were partly in line with H3. The results showed, first, that achievement did not moderate intervention effects in preparation for career setbacks, suggesting that in this career preparation outcome efficacy is not dependent on adolescent academic achievement. However, adolescent academic achievement was found to significantly moderate delayed intervention effects in both career-related insecurity and career-choice self-efficacy. The results showed that while academic achievement did not moderate immediate intervention effects from pre- to post-measurement, adolescents with low academic achievement particularly benefited from iACT (without face-to-face contact) with regard to decreased career-related insecurity and increased career-choice self-efficacy from post- to follow-up measurement.

Poor academic achievement is related to more limited career options being available and to a heightened need for making alternative plans if the primary educational choices are not realized (see also Negru-Subtirica, & Pop, 2010; Savickas, 2013). Low academic achievement has also been shown to be the strongest proximal predictor of subsequent school drop-out and difficulties in forming stable educational and vocational careers (Bowers et al., 2013; Cortiella, 2011). In addition, academic achievement directly impacts adolescents' learning motivation and global learning strategies (Richardson, Abraham, & Bond, 2012). Our results suggest that adolescents with poor academic achievement may particularly benefit from ACT interventions to promote their career preparation. However, at the same time the results suggest that vulnerable adolescents perhaps need a longer intervention or follow-up sessions compared to other adolescents as their intervention effects were not visible immediately but only in the follow-up measurement. Negative beliefs of efficacy and expectations and the associated emotional responses that reinforce and justify avoidance behavior may be confronted through ACT (Hayes et al., 2004; Hoare et al., 2012). This result is important because it

suggests that ACT interventions have the potential to promote career planning in this highly vulnerable group in regards to future outcomes.

Limitations and Future Directions

This study is not without limitations. First, although the results were interesting and promising, the overall intervention effects of the online ACT intervention for adolescents' career preparation were small albeit moderate for subgroups. One possible explanation for this is that the length of the online ACT intervention was only five weeks and career domain was only one of the multiple life domains in focus. On the other hand, career choices are made in a broader life context, and these surely interact, e.g., problems in adolescents' well-being might hinder career preparation, and ACT interventions may help to adjust and overcome well-being problems. Second, the weekly contact was short, consisting of short questions and encouraging SMS messages and in the face group extra face-to-face time was minimal. It is possible that the weekly support was not sufficient to have a substantial impact on the efficacy of the intervention. In future research, it would be interesting to explore the influence of a larger variation in face-to-face and online contact on the intervention results. Additionally, an investigation of possible mediating mechanisms (e.g., psychological skills that are enhanced in ACT) of intervention effects is an important future challenge.

Another limitation is that the results can be generalized only for a general sample of 15- to 16-year-old Finnish adolescents before they made critical educational choices regarding upper secondary education (i.e., vocational vs. academic track). Career planning and decision-making regarding upper secondary studies was thus topical for all the participants. However, there may be individual differences in the need of preventive career intervention; it is possible that educational plans regarding upper secondary studies were crystallized for many adolescents already before the conducted iACT intervention. Further studies are needed to examine the moderator impact of the people's need for an intervention, the efficacy of iACT in promoting different aged adolescents' career preparation and also among adolescents from other educational and cultural contexts. Finally, it is notable that despite the excellent reliability and successful prior use (Koivisto et al., 2011), the scales used to measure

adolescent career preparation were relatively short. Hence, future studies are needed to measure adolescents' career preparation more thoroughly with more comprehensive scales.

Conclusions and Practical Implications

The results suggest that brief ACT-based online intervention programs have the potential to promote adolescent career preparation. Given the rapid changes in contemporary life contexts, psychological flexibility and adaptability are important for maintaining well-being and successful educational and vocational careers (Hoare et al., 2012). ACT has the potential to contribute to and promote adolescent career preparation. ACT aims to increase committed action while also improving skills to approach one's inner experiences with acceptance and overcome thoughts that may function as barriers to make choices and take steps in accordance with long-term goals. An advantage of providing ACT based interventions to promote career-planning is that the associated skills can be utilized in various contexts. Given the frequent intersection of career and personal counseling, it may be argued that the ideal scenario is for counselors and psychologists to be prepared, via training and experience, to deal with both career and personal concerns when aiming to effectively promote adolescent career preparation (see also Hoare et al., 2012 regarding the potential of ACT in adult career counseling).

The results of this study also showed that the two face-to-face meetings did not have any or had only limited additional impact when the iACT was provided with online support for all the adolescents, which suggests a need for future research. These results are promising because they suggest that ACT in an online format within a school context may bring about effective changes in career preparation of adolescents. Improved career preparation and high abilities to cope with career decisional tasks, in turn, have been connected with subsequent academic commitment and adjustment in higher education, which, in turn, are associated with successful vocational development (Germeijs & Verschueren, 2007; Keller & Whiston, 2008). The study suggests that it would be useful to investigate further the potential of web-based acceptance and commitment interventions among adolescents in the domain of career preparation. The online program can be delivered in diverse ways,

as a supporting tool to groups, or school personnel such as nurses, counselors or school psychologists may offer face-to-face meetings supporting the online program. Web and mobile technology makes this kind of intervention feasible, easy to implement, and cost effective (Ciarrochi et al., 2012; Hayes & Ciarrochi, 2015; Authors, 2019).

At the same time, it is important to keep in mind that the current results also suggest that online ACT interventions may be especially effective in promoting career preparation for certain subgroups of adolescents. One possible explanation for these results is that the investigated subgroup characteristics are related to individual differences in the need of career intervention. For example, our results suggest that career preparation of vulnerable adolescents (e.g., those with low academic achievement; see also Vuori et al., 2008) who likely need further guidance and counseling do indeed benefit from iACT (see also Pope, 2015). At the same time, our results suggest that vulnerable adolescents might need a longer intervention or follow-up sessions compared to other adolescents. Future research is needed to better understand whether boys and girls or adolescents with varying levels of academic achievement are different in their need for support, and whether they need different kinds of online intervention programs. The key factor is how to find the best strategies for engaging the adolescents in this intervention. Therefore, future studies should focus on how to identify the elements of the program that might be both engaging and make the intervention more effective.

References

- Alisic, A., & Wiese, B. S. (2020). Keeping an insecure career under control: The longitudinal interplay of career insecurity, self-management, and self-efficacy. *Journal of Vocational Behavior, 120*, 103431. <https://doi.org/10.1016/j.jvb.2020.103431>
- Agnew-Davies, R., Stiles, W. B., Hardy, G. E., Barkham, M., & Shapiro, D. A. (1998). Alliance structure assessed by the Agnew Relationship Measure (ARM). *British Journal of Clinical Psychology, 37 (Pt 2)(2)*, 155–172.
doi: 10.1111/j.2044-8260.1998.tb01291.x.
- Ardito, R. B., & Rabellino, D. (2011). Therapeutic alliance and outcome of psychotherapy:

- historical excursus, measurements, and prospects for research. *Frontiers in Psychology*, 2, 270. <https://doi.org/10.3389/fpsyg.2011.00270>
- Armstrong, A. B., Morrison, K. L., & Twohig, M. P. (2013). A preliminary investigation of acceptance and commitment therapy for adolescent obsessive-compulsive disorder. *Journal of Cognitive Psychotherapy*, 27, 175–190. <https://doi.org/10.1891/0889-8391.27.2.175>
- Afshar, E. K., Hatami, M., Ahadi, H., & Maddahj, M. E. (2016). Efficacy of treatment acceptance and commitment and emotion regulation strategies on anxiety sensitivity, excitement irregularities and self-efficacy. *International Journal of Medical Research and Health Sciences*, 5(11), 294–300.
- Betz, N. E. (2007). Career self-efficacy: Exemplary recent research and emerging directions. *Journal of Career Assessment*, 15, 403–422. <https://doi.org/10.1177/1069072707305759>
- Betz, N. E., & Borgen, F. H. (2009). Comparative effectiveness of CAPA and FOCUS online. *Journal of Career Assessment*, 17(4), 351–366. <https://doi.org/10.1177/1069072709324229>
- Betz, N. E., & Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *Journal of Counseling Psychology*, 28(5), 399–410. <https://doi.org/10.1037/0022-0167.28.5.399>
- Bond, F. W., & Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology*, 88, 1057–1067. doi: 10.1037/0021-9010.88.6.1057
- Bond, F. W., & Flaxman, P. E. (2006). The ability of psychological flexibility and job control to predict learning, job performance, and mental health. *Journal of Organizational Behavior Management*, 26, 113–130. https://doi.org/10.1300/J075v26n01_05
- Bond, F. W., Flaxman, P. E., Veldhoven, M. V., Biron, M. (2010). The impact of psychological flexibility and acceptance and commitment therapy (ACT) on health and productivity at work. In J. Houdmout., & S. Leka (eds.). *Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice* (pp. 296–313). Wiley-Blackwell.

- Bond, F. W., Flaxman, P. E., & Bunce, D. (2008). The influence of psychological flexibility on work redesign: Mediated moderation of a work reorganization intervention. *Journal of Applied Psychology, 93*(3), 645–654. doi: 10.1037/0021-9010.93.3.645
- Bowers, A. J., Sprott, R., & Taff, S. A. (2013). Do we know who will drop out? A review of the predictors of dropping out of high school: Precision, sensitivity, and specificity. *High School Journal, 96*, 77–100. doi: 10.1353/hsj.2013.0000
- Briscoe, J. (2015). Educating students for sustainable careers: in the classroom and beyond. In A. De Vos & Van Der Heijden, B. (Eds.), *Handbook of sustainable careers*. Elgar: UK (pp. 415–432). doi: 10.4337/9781782547037.00032
- Brown, D. (2007). *Career information, career counseling and career development* (9th ed.). Boston, MA: Pearson Allyn & Bacon.
- Brown, S. D., & Lent, R. W. (2016). Vocational psychology: Agency, equity, and well-being. *Annual Review of Psychology, 67*, 541–565. doi: 10.1146/annurev-psych-122414-033237
- Brown, S. D., & Ryan Krane, N. E. (2000). Four (or five) sessions and a cloud of dust: Old assumptions and new observations about career counseling. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (3rd ed., pp. 740–766). New York, NY: Wiley
- Bronk, K.C., Hill, P.L., Lapsley, D.K., Tasneem L. Talib, T.L., & Finch, H. (2009). Purpose, hope, and life satisfaction in three age groups. *Journal of Positive Psychology, 4*, 500–510. <https://doi.org/10.1080/17439760903271439>
- Burrow, A. I., O'Dell, A. C., & Hill, P. L. (2010). Profiles of a developmental asset: Youth purpose as a Context for hope and well-Being. *Journal of Youth and Adolescence, 39*, 1265–73. doi: 10.1007/s10964-009-9481-1.
- Choi, B. Y., Park, H., Yang, E., Lee, S. K., Lee, Y., & Lee, S. M. (2012). Understanding career decision self-efficacy. *Journal of Career Development, 39*, 443–460. <https://doi.org/10.1177/0894845311398042>

- Ciarrochi, J. V., Hayes, L., Bailey, A., & Hayes, S. (2012). *Get out of your mind & into your life for teens: A guide to living an extraordinary life*. Oakland, CA: New Harbinger Publications.
doi: 10.1080/07317107.2013.846732
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. 2nd ed. Hillsdale, NJ: Lawrence Earlbaum Associates. <https://doi.org/10.4324/9780203771587>
- Cortiella, C. (2011). *The State of Learning Disabilities*. New York, NY: National Center for Learning Disabilities.
- Creed, P. A., Patton, W., & Prideaux, L.-A. (2007). Predicting change over time in career planning and career exploration for high school students. *Journal of Adolescence*, 30, 377–392.
doi: 10.1016/j.adolescence.2006.04.003
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., ... Barnekow, V. (Eds.). (2012). *Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 survey*. Health Policy for Children and Adolescents, 6.
- Desai, R. A., Krishnan-Sarin, S., Cavallo, D., & Potenza, M. N. (2010). Video-gaming among high school students: health correlates, gender differences and problematic gaming. *Pediatrics*, 126(6): e1414–e1424. *doi:* 10.1542/peds.2009-2706.
- Dindo, L., Van Liew, J. R., & Arch, J. J. (2017). Acceptance and commitment therapy: a transdiagnostic behavioral intervention for mental health and medical conditions. *Neurotherapeutics*, 14(3), 546–553. *doi:* 10.1007/s13311-017-0521-3
- Eccles, J. S. (2004). Schools, academic motivation, and stage–environment fit. In R. M. Lerner, & L. D. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 125–153) (2nd ed.). Hoboken, NJ: John Wiley & Sons.
- Finnish Youth Barometer (2017). *Opin polut ja pientareet. Nuorisoparametri 2017*. [Educational paths. Youth Barometer]. <https://tietoanuorista.fi/nuorisobarometri/nuorisobarometri-2017/>

- Flaxman, P. & 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. doi: 10.1016/j.brat.2010.05.004
- Flaxman, P. E., Bond, F. W., & Livheim, F. (2013). *The mindful and effective employee: An acceptance and commitment therapy training manual for improving well-being and performance*. Oakland, CA: New Harbinger Publications, Inc.
- Fouad, N. A., & Smith, P. L., (1996). A test of a social cognitive model for middle school students: Math and science. *Journal of Counseling Psychology*, 43, 338–346.
- Fowkes, K. M., & McWhirter, E. H. (2007). Evaluation of computer-assisted career guidance in middle and secondary education settings: Status, obstacles, and suggestions. *Journal of Career Assessment*, 15(3), 388-400. <https://doi.org/10.1177/1069072707301234>
- Gainor, K. A. (2006). Twenty-five years of self-efficacy in career assessment and practice. *Journal of Career Assessment*, 14, 16–18. doi: 10.1177/1069072705282435
- Gavin, L. A., & Furman, W., (1989). Age differences in adolescents' perceptions of their peer groups. *Developmental Psychology*, 25, 821–834. <https://doi.org/10.1037/0012-1649.25.5.827>
- Germeijs, V., & Verschueren, K. (2007). High school students' career decision-making process: Consequences for choice implementation in higher education. *Journal of Vocational Behavior*, 70, 223–241. <https://doi.org/10.1016/j.jvb.2006.10.004>
- Guest, D., & Rodrigues, R. (2015). Career control. A. De Vos & Van Der Heijden, B. (Eds.), *Handbook of sustainable careers*. Elgar: UK (pp. 205–223).
- Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, 35, 639–665. [https://doi.org/10.1016/S0005-7894\(04\)80013-3](https://doi.org/10.1016/S0005-7894(04)80013-3)
- Hayes, L. L., & Ciarrochi, J. (2015). *The thriving adolescent: Using acceptance and commitment therapy and positive psychology to help teens manage emotions, achieve goals, and build connection*. Oakland, CA: Context Press.

- Hayes, S. C., & Hofmann, S. G. (2017). The third wave of cognitive behavioral therapy and the rise of process-based care. *World Psychiatry, 16*(3), 255–246. <https://doi.org/10.1002/wps.20442>
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44*(1), 1–25.
- Hayes, S. C., Pistorello, J., & Levin, M. E. (2012a). Acceptance and commitment therapy as a model of behavior change. *Counseling Psychologist, 40*(7), 976–1002.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012b). *Acceptance and commitment therapy: The process and practice of mindful change* (2nd ed.). Guilford Press.
- Hayes, S. C., Strosahl, K. D., Bunting, K., Twohig, M., & Wilson, K. G. (2004). What is acceptance and commitment therapy? In S. C. Hayes & K. D. Strosahl (Eds.), *A practical guide to acceptance and commitment therapy* (pp. 3–29). New York, NY: Springer.
- Hill, P. L., Burrow, A. L., & Sumner, R. (2013). Addressing important questions in the field of adolescent purpose. *Child Development Perspectives, 7*, 232–236. <https://doi.org/10.1111/cdep.12048>
- Hirvonen, R., Yli-Kivistö, L., Putnam, D. W., Ahonen, T., & Kiuru, N. (2019). School-related stress among sixth-grade students - Associations with academic buoyancy and temperament. *Learning and Individual Differences, 70*, 100–108. <https://doi.org/10.1016/j.lindif.2019.01.012>
- Hoare, N., & McIlveen, P., & Hamilton, N. (2012). Acceptance and commitment therapy (ACT) as a career counselling strategy. *International Journal for Educational and Vocational Guidance, 12*, 171–187. doi: 10.1007/s10775-012-9224-9
- Keller, B. K., & Whiston, S. C. (2008). The role of parental influences on young adolescents' career development. *Journal of Career Assessment, 16*(2), 198–217. <https://doi.org/10.1177/1069072707313206>
- Khashouei, M. M., Ghorbani, M., & Tabatabaei, F. (2016). The effectiveness of acceptance

- and commitment therapy (ACT) on self-efficacy, perceived stress and resiliency in type II diabetes patients. *Global Journal of Health Science*, 9(5), 18. doi: 10.5539/gjhs.v9n5p18
- Kidd, J. M. (2004). Emotion in career contexts: Challenges for theory and research. *Journal of Vocational Behavior*, 64, 441–454. <https://doi.org/10.1016/j.jvb.2003.12.009>
- Kidd, J. M. (2008). Exploring the components of career well-being and the emotions associated with significant career experiences. *Journal of Career Development*, 35, 166–186. <https://doi.org/10.1177/0894845308325647>
- Kiuru, N., Aunola K., Vuori, J., & Nurmi, J.-E. (2007). The role of peer groups in adolescents' educational expectations and adjustment. *Journal of Youth and Adolescence*, 36, 995–1009. doi 10.1007/s10964-006-9118-6
- Koivisto, P., Vinokur, A. D., & Vuori, J. (2011). Effects of career choice intervention on components of career preparation. *The Career Development Quarterly*, 59(4), 345–366. <https://doi.org/10.1002/j.2161-0045.2011.tb00074.x>
- Lent, R. (Ed.). (2013). *Social cognitive career theory*. NJ, USA: John Wiley.
- Lent, R., & Brown, S. (2013) Understanding and facilitating career development in the 21st century. In Brown, S., & Lent, R (eds.), *Career development and counseling: Putting theory and research to work*. 2. edition (pp. 1–26). Hoboken, NJ: John Wiley.
- Lent, R., Brown, S., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45(1), 79–122. doi:10.1006/JVBE.1994.1027
- Lent, R. W., Lopez, F. G., & Bieschke, K. J. (1993). Predicting mathematics-related choice and success behaviors: Test of an expanded social cognitive model. *Journal of Vocational Behavior*, 42, 223–236. <https://doi.org/10.1006/jvbe.1993.1016>
- Lent, R. W., Brown, S. D., & Schmidt, J. A. (2005). Social cognitive predictors of academic interests and goals in engineering: Utility for women and students at historically black universities. *Journal of Counseling Psychology*, 52(1), 84-92.

- Levin, M. E., Haeger, J. A., Pierce, B.G., Twohig, M. P. (2017). Web-based acceptance and commitment therapy for mental health problems in college students: A randomized controlled trial. *Behavior Modification*, *41*, 141–162. doi: 10.1177/0145445516659645
- Marcenaro–Gutierrez. O., Lopez–Agudo, L. A., Ropero–García, M. A. (2017). Gender differences in adolescents’ academic achievement. *Young*, *26*(3) 250–270. doi: 10.1177/110330881771516
- Mcknight, P. E., & Kashdan, T. B. (2009). Purpose in life as a system that creates and sustains health and well-being: An integrative, testable theory. *Review of General Psychology*, *13*, 242–251. doi:10.1037/a0017152
- Moazzezi, M., Moghanloo, V., Moghanloo, R., & 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), 956. doi: 10.17795/ijpbs956
- Moore, D., Wilson, K. G., Wilson, D. M., Murrell, A. R., Roberts, M., Merwin, R. (2003). *Treating at-risk youth with an in-school acceptance and commitment training program*. Paper presented at the meeting of the Association for Behavior Analysis. San Francisco, CA.
- Muthén, L., & Muthén, B. O. (1995–2020). Mplus Version 8 & Mplus users’ guide. Retrieved from <http://www.statmodel.com>.
- Muto, T., Hayes, S. C. & Jeffcoat, T. (2011). The effectiveness of Acceptance and Commitment Therapy bibliotherapy for enhancing the psychological health of Japanese college students living abroad. *Behavior Therapy*, *42*, 323–335. doi: 10.1016/j.beth.2010.08.009
- Negru-Subtirica, O., & Pop, E.I. (2016). Longitudinal links between career adaptability and academic achievement in adolescence. *Journal of Vocational Behavior*, *93*, 163–170. doi: 10.1016/j.jvb.2016.02.006
- 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, 134–144.

<https://doi.org/10.1016/j.jcbs.2017.02.006>

Pistorello, J. (Ed.). (2013). *Mindfulness and Acceptance for Counseling College Students: Theory and Practical Applications for Intervention, Prevention, and Outreach*. Oakland, CA: Context Press.

Pomerantz, E. M., Altermatt, E. R., Saxon, J. L. (2002). Making the grade but feeling distressed: Gender differences in academic performance and internal distress. *Journal of Educational Psychology*, 94, 396–404. <https://doi.org/10.1037/0022-0663.94.2.396>

Pots, W.T.M., Fledderus, M., Meulenbeek, P.A.M., Klooster, P.M., Schreurs, M.G., & Bohlmeijer, E.T. (2016). Acceptance and commitment therapy as a web-Based intervention for depressive symptoms: Randomised controlled trial. *British Journal of Psychiatry*, 208, 69–77. doi: 10.1192/bjp.bp.114.146068

Pope, M. (2015). *Career intervention: From the industrial to the digital age*. In P. J. Hartung, M. L. Savickas, & W. B. Walsh (Eds.), *APA handbooks in psychology®. APA handbook of career intervention, Vol. 1. Foundations* (1–19). American Psychological Association

Puolakanaho, A., Tolvanen, A., Kinnunen, S. M., & Lappalainen, R. (2018). Burnout-related ill-being at work: Associations between mindfulness and acceptance skills, worksite factors, and experienced well-being in life. *Journal of Contextual Behavioral Science*, 10, 92-102. <https://doi.org/10.1016/j.jcbs.2018.09.003>

Ranganathan, P., Pramesh, C. S., & Aggarwal, R. (2016). Common pitfalls in statistical analysis: Intention-to-treat versus perprotocol analysis. *Perspectives in Clinical Research*, 7(3), 144–146. doi:10.4103/2229-3485.184823

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 353–387. <https://doi.org/10.1037/a0026838>

Räsänen, P., Lappalainen, P., Muotka, J., Tolvanen, A., & Lappalainen, R. (2016). An online

guided ACT intervention for enhancing the psychological wellbeing of university students: A randomized controlled clinical trial. *Behaviour Research and Therapy*, 78, 30–42. doi: 10.1016/j.brat.2016.01.001

Sainio, P., Eklund, K., Ahonen, T. & Kiuru, N. (2019). The role of learning difficulties in adolescents' academic emotions and academic achievement. *Journal of Learning Disabilities*, 52, 287–298. doi: 10.1177/0022219419841567

Savickas, M. L. (2005). The theory and practice of career construction. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 42–70). Hoboken, NJ: Wiley.

Savickas, M. L. (2013). Career construction theory and practice. In R. W. Lent & S. D. Brown (Eds.), *Career development and counselling: Putting theory and research into work* (2nd ed., pp. 147-183). Hoboken, NJ: Wiley.

Schultheiss, D. E. P. (2003). A relational approach to career counseling: Theoretical integration and practical application. *Journal of Counseling & Development*, 81, 301–310. doi: 10.1002/j.1556-6678.2003.tb00257.x

Sprenkle, D. H., Davis, S. D. & Lebow, J. L. (2009). *Common factors in couple and family therapy: the overlooked foundation for effective practice*. New York: Guilford Press.

Strosahl, K. D., Robinson, P. J., & Gustavsson, T. (2012). *Brief interventions for radical change: Principles and practice of focused acceptance and commitment therapy*. Oakland, CA: New Harbinger Publications.

Super, D. E. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior*, 16, 282-298. [https://doi.org/10.1016/0001-8791\(80\)90056-1](https://doi.org/10.1016/0001-8791(80)90056-1)

Super, D. E. (1990). A life span, life space approach to career development. In D. Brown & L. Brooks (Eds.), *Career choice and development* (2nd ed., pp. 197–261). San Francisco, CA: Jossey-Bass.

- 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 Science*, 4(2), 73–85. <https://doi.org/10.1016/j.jcbs.2015.02.001>.
- Sweeny, K., Carroll, P. J., & Shepperd, J. A. (2006). Is optimism always best? Future outlooks and preparedness. *Current Directions in Psychological Science*, 15, 302–306. <https://doi.org/10.1111/j.1467-8721.2006.00457.x>
- Tan, K., Shin, O.J., Le, H., & Dung, M. (2018). Does gender relate to social skills? Exploring differences in social skills mindsets, academics, and behaviors among high-school freshmen students. *Psychology in the Schools*, 55(4), 429–442. <https://doi.org/10.1002/pits.22118>
- Taylor, K. M., & Betz, N. E. (1983). Applications of self-efficacy theory to the understanding and treatment of career indecision. *Journal of Vocational Behavior*, 22, 63–81. [https://doi.org/10.1016/0001-8791\(83\)90006-4](https://doi.org/10.1016/0001-8791(83)90006-4)
- Tirpak, D.M., & Schlosser, L. Z. (2013). Evaluating FOCUS-2's effectiveness in enhancing first-year college students' social cognitive career development. *Career Development Quarterly*, 61(2), 110–123. doi: 10.1002/j.2161-0045.2013.00041.x
- Turner, S. L., & Lapan, R. T. (2004). Evaluation of an intervention to increase non-traditional career interests and career-related self-efficacy among middle-school adolescents. *Journal of Vocational Behavior*, 66(3), 516–531. <https://doi.org/10.1016/j.jvb.2004.02.005>
- Vuori, J., Koivisto, P., Mutanen, P., Jokisaari, M., & Salmela-Aro, K. (2008). Towards Working Life: Effects of an intervention on mental health and transition to post-basic education. *Journal of Vocational Behavior*, 72, 67–80. <https://doi.org/10.1016/j.jvb.2007.10.003>
- Välimäki, M., Anttila, K., Anttila, M., & Lahti, M. (2017). Web-based interventions supporting adolescents and young people with depressive symptoms: systematic Review and meta-analysis. *JMIR mHealth and uHealth*, 5(12), e180. doi: 10.2196/mhealth.8624
- Whiston, S. C., Li, Y., Mitts, N. G., & Wright, L., (2017). Effectiveness of career choice

interventions: A meta-analytic replication and extension. *Journal of Vocational Behavior*, *100*, 175–184. <https://doi.org/10.1016/j.jvb.2017.03.010>

Wicksell, R. K., Melin, L., Lekander, M., Olsson, G. L. (2009). Evaluating the effectiveness of exposure and acceptance strategies to improve functioning and quality of life in longstanding pediatric pain. *Pain*, *141*, 248–257. doi: 10.1016/j.pain.2008.11.006

Journal Pre-proof

Conflict of Interest statement

Conflict of Interest. The authors declare that they have no conflict of interest. **Ethical**

Approval. This study was conducted in compliance with APA ethical standards. It was approved by the Ethical Committee of the University of Jyväskylä, and has been registered at ClinicalTrials.gov.

Informed Consent. Informed consent was obtained from all the participants of the study. **Funding.** This study was funded by the Finnish Cultural Foundation and the Academy of Finland (No.324638).

Data Sharing and Declaration. The datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Authors' contributions

NK conceived of the study, participated in the design and coordination, led the main study including implementation of the data collection and interventions, analyzed the data and drafted the manuscript; AP, PL and RL planned the intervention program, participated in the design and helped to draft the manuscript, KK and SM participated in interpretation of the data and helped to draft the manuscript, and JM participated in the data analyses and interpretation of the data. All authors read and approved the final manuscript.

Journal Pre-proof

Figure 1. Participant flow diagram

Table 1. Participant Characteristics.

Baseline characteristics	All (n=243)	iACTface- (n=81)	iACT (n=80)	Control (n=82)
Age <i>M</i> (<i>SD</i>)	15.27 (0.39)	15.25 (0.30)	15.27 (0.33)	15.29 (0.50)
Gender				
Female	124 (51%)	44 (54.3%)	37 (46.3%)	38 (46.3%)
Male	119 (49%)	37 (45.7%)	43 (53.8%)	44 (53.7%)
Mother tongue				
Finnish	230 (94.7%)	77 (95.1%)	74 (92.5%)	79 (96.3%)
Other than Finnish	8 (3.3%)	3 (3.7%)	3 (3.8%)	2 (2.4%)
Bilingual	4 (1.6%)	1 (1.2%)	2 (2.5%)	1 (1.2%)
Living with				
Mother and Father	167 (68.7%)	52 (64.2%)	59 (73.8%)	56 (68.3%)
Only with mother or father	20 (8.2%)	12 (14.8%)	4 (4.1%)	4 (4.9%)
Alternately with mother and father	38 (15.6%)	11 (13.6%)	12 (15.0%)	15 (18.3%)
Others*	14 (5.7%)	4 (4.9%)	3 (3.8%)	7 (8.5%)

* Living with mother and stepfather, father and stepmother, foster care or approved home

Table 2. Means and standard deviations for career preparation indicators for pre, post and follow-up measurements in the iACTface ($n = 64$), the iACT ($n = 59$) and the control ($n = 82$) groups of all adolescents and separately for girls and boys for those who fulfilled the adherence criterion (i.e., completed at least three modules of the iACT intervention; per protocol analysis)

	Pre			Post			Follow-up		
	All <i>M</i> (<i>SD</i>)	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)	All <i>M</i> (<i>SD</i>)	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)	All <i>M</i> (<i>SD</i>)	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)
Career-choice self-efficacy									
iACTface	3.67 (0.75)	3.49 (0.73)	3.94 (0.71)	3.81 (0.63)	3.73 (0.60)	3.92 (0.67)	3.80 (0.67)	3.81 (0.67)	3.78 (0.67)
iACT	3.72 (0.68)	3.66 (0.65)	3.79 (0.72)	3.71 (0.79)	3.74 (0.80)	3.67 (0.78)	3.80 (0.70)	3.68 (0.74)	3.93 (0.64)

Control	3.71 (0.70)	3.69 (0.69)	3.72 (0.71)	3.72 (0.63)	3.64 (0.65)	3.79 (0.60)	3.76 (0.65)	3.71 (0.63)	3.81 (0.67)
Career-related insecurity									
iACTface	2.93 (1.11)	3.13 (1.06)	2.60 (1.14)	2.83 (0.97)	3.13 (0.89)	2.40 (0.94)	2.83 (1.06)	2.93 (1.01)	2.66 (1.14)
iACT	3.15 (1.07)	3.13 (1.15)	3.19 (0.99)	2.78 (1.15)	3.00 (1.14)	2.52 (1.14)	2.56 (1.07)	2.72 (0.94)	2.36 (1.19)
Control	2.88 (1.15)	3.05 (1.03)	2.74 (1.24)	2.84 (1.14)	3.17 (1.03)	2.56 (1.16)	2.81 (1.22)	2.94 (0.96)	2.69 (1.39)
Preparation against career setbacks									
iACTface	2.63 (1.06)	2.51 (1.01)	2.82 (1.13)	2.69 (1.00)	2.68 (0.91)	2.70 (1.13)	2.65 (0.92)	2.52 (0.80)	2.86 (1.09)
iACT	2.72 (0.92)	2.75 (0.88)	2.69 (0.98)	2.83 (0.94)	2.83 (0.78)	2.83 (1.13)	2.69 (1.07)	2.72 (0.98)	2.66 (1.19)
Control	2.88 (1.01)	2.85 (0.75)	2.90 (1.20)	2.78 (0.97)	2.87 (0.95)	2.70 (0.99)	2.94 (1.02)	2.82 (0.74)	3.03 (1.20)

Table 3. HLM results for predicting changes in career preparation in the iACTface (n = 64), the iACT (n = 59) and the Control (n = 82) groups (per protocol analysis)

Dependent variable: Career-choice self-efficacy						
Predictors	Model 1		Model 2		Model 3	
	Pre-post Est(s.e.)	Post-follow Est(s.e)	Pre-post Est(s.e)	Post-follow Est(s.e)	Pre-post Est(s.e)	Post-follow Est(s.e)
iACTface	0.14(0.09)	-0.02(0.10)	0.02(0.12)	-0.12(0.13)	0.16(0.09)*	-0.03(0.09)
iACT	-0.03(0.10)	0.06(0.09)	-0.20(0.14)	0.26(0.13)*	-0.03(0.10)	0.10(0.10)
Gender ¹			0.13(0.12)	-0.05(0.13)		
GPA					-0.06(0.07)	0.14(0.07)*
Gender x iACTface			0.41(0.17)*	0.15(0.19)		
Gender x iACT			0.33(0.18)	-0.36(0.18)*		
GPA x iACTface					0.03(0.09)	-0.03(0.09)
GPA x iACT					0.14(0.09)	-0.30(0.11)**
Dependent variable: Career-related insecurity						
Predictors	Model 1		Model 2		Model 3	
	Pre-post Est(s.e.)	Post-follow Est(s.e)	Pre-post Est(s.e)	Post-follow Est(s.e)	Pre-post Est(s.e)	Post-follow Est(s.e)
iACTface	-0.07(0.19)	0.03(0.19)	0.02(0.32)	0.15(0.32)	-0.02(0.20)	-0.01(0.19)
iACT	-0.34(0.18)*	-0.17(0.19)	-0.48(0.27)*	-0.29(0.32)	-0.21(0.18)	-0.22(0.19)
Gender ¹			-0.30(0.23)	0.36(0.23)		
GPA					-0.02	-0.29(0.16)
Gender x iACTface			-0.14(0.40)	-0.11(0.39)		
Gender x iACT			0.24(0.37)	0.26(0.38)		
GPA x iACTface					0.04(0.24)	-0.04(0.25)
GPA x iACT					0.19(0.26)	0.51(0.25)*
Dependent variable: Preparation against career setbacks						
Predictors	Model 1		Model 2		Model 3	
	Pre-post Est(s.e.)	Post-follow Est(s.e)	Pre-post Est(s.e)	Post-follow Est(s.e)	Pre-post Est(s.e)	Post-follow Est(s.e)
iACTface	0.17(0.18)	-0.28(0.29)	0.08(0.31)	-0.09(0.33)	0.14(0.18)	-0.13(0.19)
iACT	0.21(0.18)	-0.30(0.20)	0.35(0.27)	-0.51(0.31)	0.22(0.19)	-0.32(0.20)
Gender ¹			-0.23(0.24)	0.37(0.25)		

GPA			-0.02(0.16)	0.24(0.14)
Gender x iACTface	0.09(0.37)	-0.04(0.41)		
Gender x iACT	-0.29(0.36)	0.44(0.42)		
GPA x iACTface			0.07(0.21)	-0.31(0.21)
GPA x iACT			-0.24(0.20)	-0.28(0.23)

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Journal Pre-proof

Table 4. Between and within group effect sizes of changes in career preparation in the iACTface ($n = 64$), the iACT ($n = 59$) and the Control ($n = 82$) groups for the whole sample and separately for girls and boys (per protocol analysis)

	Pre-post (all)		Pre-post (girls)		Pre-post (boys)	
	d_b	d_w	d_b	d_w	d_b	d_w
Career-choice self-efficacy						
iACTface	f/c = 0.15	0.22*	f/c = 0.47*	0.48***	f/c = 0.32	0.21
iACT	w/c = 0.03	0.10	w/c = 0.02	0.02	w/c = 0.06	0.19
Control		0.07		0.01		0.13
Career-related insecurity						
iACTface	f/c = 0.04	0.10	f/c = 0.11	0.11	f/c = 0.08	0.03
iACT	w/c = 0.48**	0.56***	w/c = 0.27	0.38	w/c = 0.73*	0.78**
Control		0.06		0.11		0.05
Preparation against career setbacks						
iACTface	f/c = 0.03	0.04	f/c = 0.04	0.02	f/c = 0.04	0.09
iACT	w/c = 0.10	0.03	w/c = 0.03	0.00	w/c = 0.15	0.02
Control		0.07		0.04		0.12
	Post-follow-up (all)		Post-follow-up (girls)		Post-follow-up (boys)	
	d_b	d_w	d_b	d_w	d_b	d_w
Career-choice self-efficacy						
iACTface	f/c = 0.04	0.01	f/c = 0.04	0.14	f/c = 0.19	0.18
iACT	w/c = 0.10	0.13	w/c = 0.15	0.07	w/c = 0.40*	0.39**
Control		0.04		0.09		0.00
Career-related insecurity						
iACTface	f/c = 0.04	0.05	f/c = 0.04	0.21	f/c = 0.15	0.27
iACT	w/c = 0.15	0.19	w/c = 0.03	0.26	w/c = 0.24	0.13
Control		0.03		0.24		0.10
Preparation against career setbacks						
iACTface	f/c = 0.19	0.03	f/c = 0.14	0.21	f/c = 0.13	0.17
iACT	w/c = 0.21	0.14	w/c = 0.08	0.13	w/c = 0.37	0.14
Control		0.16		0.06		0.30

d_b = between group effect size; d_w = within group effect size, f/c = iACTface vs. Control, w/c = iACT vs. Control, * $p < 0.05$

Appendix 1. Intention-to-treat results

Stable 1. HLM results for predicting changes in career preparation for all adolescents originally randomized in the iACTface ($n = 75-81$), the iACT ($n = 70-80$) and the Control ($n = 79-82$) groups

Dependent variable: Career-choice self-efficacy						
Predictors	Model 1		Model 2		Model 3	
	Pre-post Est(s.e.)	Post-follow Est(s.e.)	Pre-post Est(s.e.)	Post-follow Est(s.e.)	Pre-post Est(s.e.)	Post-follow Est(s.e.)
iACTface	0.10(0.09)	0.02(0.09)	-0.14(0.13)	-0.03(0.12)	0.13(0.09)	0.02(0.09)
iACT	-0.03(0.09)	0.05(0.09)	-0.16(0.13)	0.17(0.12)	-0.01(0.09)	0.06(0.09)
Gender ¹			0.13(0.12)	-0.05(0.13)		
GPA					-0.05(0.07)	0.14(0.07)*
Gender x iACTface			0.45(0.17)**	0.06(0.18)		
Gender x iACT			0.27(0.17)	-0.25(0.17)		
GPA x iACTface					0.07(0.09)	-0.08(0.10)
GPA x iACT					0.10(0.10)	-0.21(0.10)*
Dependent variable: Career-related insecurity						
Predictors	Model 1		Model 2		Model 3	
	Pre-post Est(s.e.)	Post-follow Est(s.e.)	Pre-post Est(s.e.)	Post-follow Est(s.e.)	Pre-post Est(s.e.)	Post-follow Est(s.e.)
iACTface	-0.07(0.18)	-0.17(0.18)	-0.05(0.23)	0.12(0.29)	0.01(0.19)	-0.02(0.18)
iACT	-0.19(0.19)	0.01(0.18)	-0.04(0.23)	-0.43(0.27)	-0.20(0.18)	-0.12(0.18)
Gender ¹			-0.30(0.23)	0.36(0.23)		
GPA					-0.02(0.20)	-0.29(0.16)
Gender x iACTface			-0.32(0.38)	-0.15(0.36)		
Gender x iACT			-0.07(0.35)	0.55(0.36)		
GPA x iACTface					-0.26(0.25)	0.06(0.23)
GPA x iACT					0.20(0.25)	0.60(0.23)*
Dependent variable: Preparation against setback						
Predictors	Model 1		Model 2		Model 3	
	Pre-post Est(s.e.)	Post-follow Est(s.e.)	Pre-post Est(s.e.)	Post-follow Est(s.e.)	Pre-post Est(s.e.)	Post-follow Est(s.e.)
iACTface	0.17(0.18)	-0.30(0.20)	0.02(0.25)	0.05(0.30)	0.10(0.18)	-0.05(0.20)
iACT	0.21(0.18)	-0.18(0.19)	0.28(0.25)	-0.49(0.28)	0.14(0.28)	-0.29(0.20)
Gender ¹			-0.23(0.24)	0.37(0.25)		
GPA					-0.02(0.16)	0.24(0.14)
Gender x iACTface			0.14(0.34)	-0.23(0.37)		
Gender x iACT			-0.23(0.34)	0.42(0.39)		
GPA x iACTface					0.11(0.20)	-0.22(0.20)
GPA x iACT					-0.24(0.19)	-0.19(0.22)

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Highlights

- This study examined ninth-grade adolescents' career preparation
- The efficacy of a web-based Acceptance and commitment therapy (ACT) program was examined
- ACT was effective for career-related insecurity and career-choice self-efficacy, but not for preparation against setbacks
- ACT-based online intervention programs have potential to promote adolescent career preparation
- Such interventions might be especially effective for subgroups of adolescents.

Journal Pre-proof

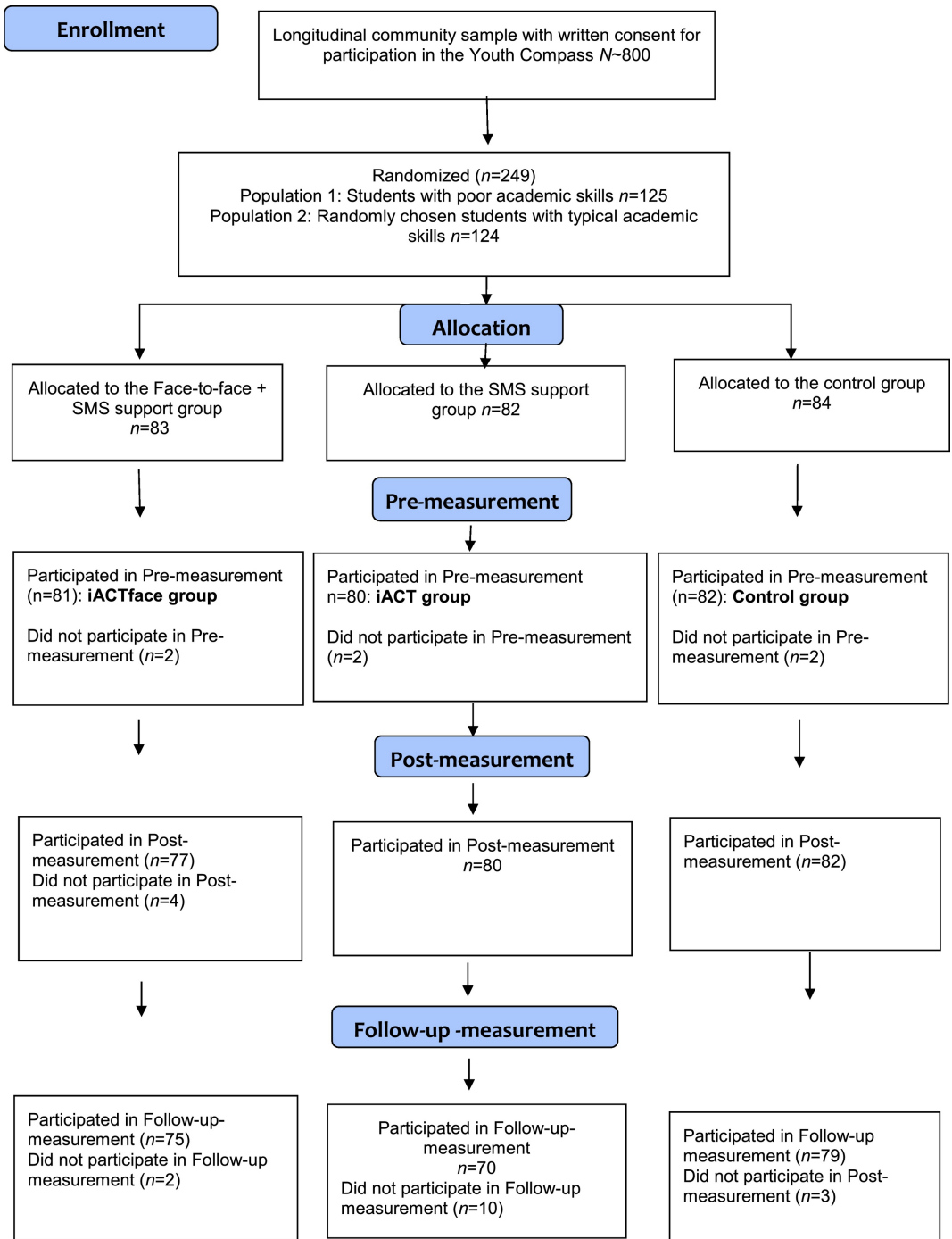


Figure 1