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Facilitating a successful school-to-work transition: Comparing compact career-adaptation interventions☆

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ABSTRACT

A successful school-to-work transition is an important yet challenging step in graduates' careers. Unfortunately, most interventions found to help students master this transition are too elaborate and time consuming to scale-up to student cohorts, as they require multiple sessions and/or one-on-one counseling. In this study, we answer to the call for more research on theory-based yet efficient career interventions that can help large numbers of students prepare for this transition. Based on career construction theory, we present and validate a scalable career intervention combining online assessments with one or two short workshops to foster students' career adaptive responses and – through this – their career adaptability, as well as their subsequent quality of employment. To evaluate the optimal intensity of the intervention, a quasi-field experiment addressed the development of career adaptive responses and adaptability between three intervention groups ($n = 48$, $n = 302$, $n = 42$) and a control group ($n = 79$) over three time points (pre-intervention, post-intervention and six months later). Structural equation modelling showed significant indirect effects from partaking in the intervention on participants' perceived fit, career growth and satisfaction in their jobs through enhanced career adaptability. Effects regarding intervention intensity were somewhat less clear. In sum, results show that a theory-based compact, scalable and partly web-based career intervention may help students prepare for the school-to-work transition and raise their chances of finding high quality employment.

Career decisions made and the direct successes achieved during the transition from university to work often influence graduates' entire future careers in terms of occupational directions (Richards, 1984), employment likelihood (Koivisto, Vuori, & Nykyri, 2007; OECD, 1998), and overall career success (Ng & Feldman, 2007; Steffy, Shaw, & Noe, 1989), whether assessed objectively (e.g., earnings, Giraud, Bernard, & Trinchera, 2019) or subjectively (e.g., job quality, Taylor, 2005; career satisfaction, Feldman, Folks, & Turnley, 1998). Increasing demands for flexibility and career self-management make this transition even more relevant (Akkermans, Schaufeli, Brenninkmeijer, & Blonk, 2013). Yet, many graduates struggle with this transition: Across the globe, youth unemployment

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levels have been historically high over the last decade (OECD, 1998). Young people with a tertiary level of education need about 9.7 months to find a stable or satisfactory job (ILO, 2015) — not only because graduates lack options, but also because graduates often flounder to find a job that fits their own interests, personalities, and skills (ILO, 2014; Solberg, Howard, Blustein, & Close, 2002).

Much research has tried to help students with career-related interventions (Langher, Nannini, & Caputo, 2018; Whiston, 2002; Whiston, Brecheisen, & Stephens, 2003; Whiston, Li, Mitts, & Wright, 2017) and the OECD (1998, 2004) repeatedly highlighted the benefits of career interventions during the transition from university to work. Yet, most interventions studied are elaborate, time-consuming, and expensive. Different reviews recommend different intervention setups (Brown & Krane, 2000; Oliver & Spokane, 1988; Whiston, Sexton, & Lasoff, 1998; Whiston, Li, Mitts, & Wright, 2017), besides bemoaning issues in research design and outcomes studied (Langher et al., 2018; OECD, 1998). The current study addresses these gaps by presenting and validating concise interventions that combine online — with workshop elements. Based on career construction theory (Savickas, 2005, 2013), the interventions built on a solid theoretical framework proven useful in earlier intervention research for enhancing short-term learning and long-term employment success (Green, Noor, & Hashemi, 2020; Koen, Klehe, & Van Vianen, 2012).

With this, the current study makes four conceptual contributions. First, it adds to the career adaptability framework (Savickas, 2005, 2013) by addressing the malleability versus stability of students' career adaptability and adaptive responses. On the one hand, we expect career adaptability to show some stability in general — students who score higher on career adaptability at one point should also do so half a year later. Yet on the other, we also hope to show that a concise intervention combining recommendations from career construction theory and general intervention research has meaningful effects on students' short- as well as long-term career adaptability and adaptive responses. In line with theorizing and previous findings, this should further benefit students in terms of their quality of employment upon graduation.

Second, the study adds to the career adaptability framework (Savickas, 2005, 2013) by examining the order of the interventions' effects. Career construction theory proposes career adaptability as a resource that fuels adaptive responding, which in turn produces positive career outcomes. Career interventions, in contrast, usually start at encouraging specific adaptive responses (e.g., exploration, planning), assuming that this encouragement translates into changes in participants' underlying resources — i.e., the order of effects would be reversed. The contribution of the current study is to test such effect in more detail, differentiating between adaptability and adaptive responding both as imminent outcomes and as proposed mechanisms by which the interventions foster employment quality.

Third, the study adds to the literature on career interventions more generally by trying to develop a more concise and thus scalable intervention than previously considered. Being concise implies resorting to high-leverage intervention components with clear conceptual foundations that are clearly defined in terms of structure and timing. On a downside, this implies less freedom than available in longer interventions to adjust components and timing to participants' individual needs. Yet, on an upside, it implies that it is really the intervention-components chosen that elicit the observed effects, rather than more individualized yet less standardized and thus less documented interactions emerging in the course of the intervention.

Methodologically, the novelty of the interventions is the use of online portfolios that can be matched to vacancies on the labour market, a compact and scalable approach that should also facilitate the transfer of training to students' actual job-search.

Finally, the study fine-grains questions on intervention effectiveness. We address the debate whether more is indeed better by systematically comparing more versus less intensive intervention setups with a control group (Whiston et al., 2003, 2017) and with one another.

1. Career adaptability and career adaptive responses

Career construction theory (Savickas, 2005, 2013) argues that in order to cope with predictable and unpredictable, current and anticipated career related tasks, transitions and traumas – including the school to work transition – people need certain psychosocial resources called career adaptability, as well as related career adaptive responses, both of which align along four interrelated factors: control, curiosity, concern, and confidence.

'Career control' concerns seeing oneself as able and responsible for constructing one's own career and making career-related choices. It shows in fewer difficulties in deciding upon one's future career, i.e., higher *career decidedness*. 'Career curiosity' is about an inquisitive mindset about one's career and oneself in order to learn about one's surrounding and to grow as a person. This would foster an adaptive response of career exploration in terms of both *self-* and *environmental exploration*, that is, pondering questions such as 'What motivates me?' and 'What are my talents?', as well as exploring potential jobs, organizations and professional fields. 'Career concern' is about looking ahead to the future and being aware that it is important to plan, and thus arguably motivates people to engage in *career planning*, i.e., of setting career-related goals and developing plans on how to reach these goals. Finally, 'career confidence' is about expecting to succeed in constructing one's career by being able to perform efficiently the tasks at hand, solve complex problems, overcome obstacles, and learn new skills, thus fostering an efficacious mindset about imminent career tasks (i.e. *career self-efficacy*), such as graduates' self-efficacy to search for and find a suitable first job (Moynihan, Roehling, LePine, & Boswell, 2003).

While the links between different career-adaptability factors and adaptive responses are not as straightforward as originally proposed (Hirschi, Herrmann, & Keller, 2015), both career adaptability and adaptive responses help people during the transitions from school to further education (Germeijs & Verschueren, 2007; Hirschi, 2010), from school to work (Koen et al., 2012) and later during one's career (Koen, Klehe, Van Vianen, Zikic, & Nauta, 2010; Zacher, 2014; Zikic & Klehe, 2006). This makes career adaptability and adaptive responses valuable for graduates seeking quality employment that fits their personal profiles and that allows them to grow in their careers.

2. Designing efficient and scalable interventions

When thinking on how to strengthen students' career adaptability for the school to work transition, Savickas (2005, 2013) developed quite elaborate counseling protocols (e.g., the career construction interview, Savickas, 2011), but also made general recommendations that we followed when trying to create a concise and scalable intervention. As is common for many career interventions, these recommendations are highly behavioral in focus and thus primarily target and practice career adaptive responses, rather than addressing career adaptability directly (see also e.g., Cheung & Jin, 2016; Koen et al., 2010). First, students should systematically explore both themselves and their environment and should reflect on their exploratory experiences to learn about their abilities, interests and values, and how these fit to types of work (career curiosity). Next, students should make deliberate career choices and intentionally direct their vocational actions (career control). They should plan for how to address the vocational tasks and occupational transitions ahead, combining an optimistic outlook with contingency plans on how to address potential obstacles (career concern). And finally, interventions should strengthen students' self-efficacy to take action and make the vocational choices to act on their interests (career confidence). Based on these recommendations, we incorporated exercises on exploration, decision-making, planning, and problem solving (Savickas, 2005, 2013; see also Koen et al., 2012) into our intervention, as well as instances of constructive individualized feedback (career confidence). We further attended to recommendations by Brown and Krane (2000; Brown et al., 2003) on components identified as generally critical for career counseling interventions, such as the use of workbooks and written exercises, individualized feedback, interpretations of the training material, opportunities to gather information on the world of work, the use of role-models, and social support.

As preparing for the school-to-work transition is important for all students, we further aimed for an intervention that is both scalable and that makes the transfer of training readily visible and manageable. Regarding scalability, computer-assisted and particularly web-based career interventions have been proposed for years (e.g., Gati & Asulin-Peretz, 2011), as they are both cost-efficient and flexible: Participants can complete assignments anytime and anywhere (Ouweneel, Le Blanc, & Schaufeli, 2013). When covering some of counselors' traditional roles (e.g., assessing interest, providing direct information), they save costs and/or allow counselors to devote their limited time to more complex intervention tasks (Gati & Asulin-Peretz, 2011). Particularly online portfolios, web-based information systems that allow individuals to demonstrate their competences, interests and personality, have been used for other career purposes such as professional development, career planning and job seeking (e.g., Balaban, Divjak, & Mu, 2011). In the context of the school-to-work transition, working on such portfolios may help students in their self-exploration (career curiosity) and thus in identifying their personal and professional strengths and weaknesses (Hallam & Creagh, 2010), which can serve as a basis for self-directed decision making (career control) and planning (career concern). A further advantage of online portfolios is that clear instructions guide users through the different steps, facilitating users' self-directed engagement with the tool when and wherever they please.

That said, computer-based interventions often don't work when used in isolation, but benefit from being combined with counseling (Whiston et al., 2003). While individual counseling may be most effective (Whiston et al., 1998), efficiency concerns and results from some meta-analyses suggest the use of structured group workshops instead (Whiston et al., 2003, 2017). Therefore, the current study combined an online portfolio intervention with one or two short structured group workshops and compared advanced university students' intervention-related changes in career adaptability and adaptive responses in comparison to a quasi-experimental control group. Given the incorporation of select exercises that specifically aim at the different components of the career adaptability framework, and given the adherence to Brown and Krane's (2000; 2003) general (theory-independent) recommendations on how to enhance participant learning, we propose that despite the brevity of the intervention:

Hypothesis 1. Compared to a control group, students undergoing a compact career adaptive responses intervention linking online — with workshop elements show an increase in (a) career adaptive responses and (b) career adaptability after the intervention.

That said, also Savickas' (2005) recommendations are highly behavioral, suggesting that practicing specific career adaptive responses strengthens career adaptive resources (career adaptability) — which then make it easier to take future action. Asking participant to explore the self- and the environmental arguably makes them more knowledgeable of their options and preferences. Guiding participants towards deliberate and organized choices arguably fosters a feeling of career control. Helping them to set goals and plan ahead arguably sharpens their career concern. By focusing on personal strengths and practicing necessary skills, participants may gain more confidence. Therefore, given the primarily behavioral nature of the interventions (exploring, problem solving, decision making, planning), we expect that:

Hypothesis 1c. The interventions' effect on career adaptability is indirect via their effect on career adaptive responses.

A true test of any intervention's effectiveness, however, lies in its' longer-term effects. Even though many researchers have stressed the significance of studying the long-term effects of career interventions (e.g. Heppner & Heppner, 2003; Savickas et al., 2009), most studies focused primarily on students' career decidedness directly after the intervention, but not on measures representing a transfer of training (i.e., sustained changes in diverse career related behaviors and attitudes), nor on the interventions' long-term effects on employment quality (Langher et al., 2018). An effective intervention should help students build their adaptive responses and adaptability not only while the training is salient in their minds, but also across time. That is, such intervention should cause a sustained shift in participants' perceptions of themselves and of their resources to act as agents of their careers. Once aware of these resources, students more likely use and benefit from them on a regular basis, so that the interventions' effects can transfer to students' daily lives, also when concrete memories of the interventions themselves may have worn off, and when participants face the regular and often conflicting demands of their daily lives (Baldwin & Ford, 1988). Statistically, this implies both a considerable stability of students' new level of career adaptability and – likely to a somewhat lesser extent – career adaptive responses across time.

Hypothesis 2. Mediated via students' career adaptive responses and adaptability directly after the interventions, the interventions' effects on (a) career adaptive responses and (b) adaptability are going to last across an extended period (6 months).

3. Fostering career success

The ultimate objective of any career intervention is not to foster career adaptability, but actual career success. The importance of career adaptability and adaptive responses for positive career outcomes has been broadly confirmed (Hänggli & Hirschi, 2020; Johnston, 2018; Rudolph, Lavigne, & Zacher, 2017) among adolescents (e.g. Germeijs & Verschueren, 2007; Hirschi, 2009), students (Koen et al., 2012), employees (Haibo, Xiaoyu, Xiaoming, & Zhijin, 2018), and job seekers (Guan et al., 2013; Koen et al., 2010; Zikic & Klehe, 2006). We therefore expect career adaptability to help students obtain employment and in particular high-quality employment. Hence, we expect:

Hypothesis 3. Via its effect on students' career adaptability, the interventions help students (a) find a post-study job and (b) experience high-quality employment (i.e., perceived fit, career growth and career satisfaction).

4. Intervention intensity

In addition to the focus (career adaptive responses and career adaptability) and type of intervention (web-based and strucstured group events), there may be an optimal level of intensity. More time in an intervention may allow participants more opportunity to examine their possible career choices and to receive more detailed and possibly better, more tailored guidance in the decision-making process. Empirically, however, the relationship between number of sessions and effect size is not yet clear, partially due to a lack of low-intensity interventions in previous research. Meta-analyzing career interventions over the past 20 years, Whiston et al. (2017) found only three studies with fewer than 5 session: one with one, one with two and one with three sessions. Similarly, all but two of the interventions included in Langher et al.'s (2018) meta-analysis on school-to-work interventions required at least two full working days or more. This makes it difficult to make clear assumptions about the impact of intervention intensity.

The current study offers a systematic evaluation and comparison between different intervention set-ups varying in length and content (Table 1). The first intervention set-up (two workshops) combined students' preparatory work online with two short workshops, one on knowing the self (2.5 h) and one on knowing the labor market (1.5 h). The second intervention set-up (combined workshop) was similar to the first set-up, but was less time-consuming as the two original workshops were combined into one 2.5 h workshop. The third set-up (short workshop) cut the part on knowing the self to a minimum and therefore did not include preparatory online work. In a 2-h workshop, students briefly focused on constructing their personal profile and mainly focused on the labor market. The control group did not participate in any career intervention. Assuming that interventions that are more intensive will have more pronounced effects, we expect:

Hypothesis 4. More intensive interventions covary with larger increases in career adaptability and career adaptive responses (a) immediately after the interventions and (b) six months later, compared to less intensive interventions.

Table 1
Contents of the training in the different intervention groups.

Section	Exercise	Factors	Activity	Two workshops	Combined workshop	Short workshop
Online portfolio	Personality questionnaire	Curiosity	Exploration (self): personality	Homework	Homework	–
	Personal motivators questionnaire	Curiosity	Exploration (self): motivators	Homework	Homework	–
	Preferred team roles questionnaire	Curiosity	Exploration (self): preferred team roles	Homework	Homework	–
	Invite others to give 360 feedback	Curiosity	Exploration (self)	Homework	Homework	–
Introduction	Welcome, relevance of preparation	Concern		Workshop 1	Workshop	Workshop
	Reflecting on personal state	Concern	Reflecting on state of preparedness	Workshop 1	Workshop	Workshop
Knowing the self	Summarizing outcomes of online questionnaires	Curiosity and control	Exploration (self)	Workshop 1	Workshop	–
	Writing personal pitch	Curiosity and control	Exploration (self) and decision making	Workshop 1	Workshop	–
	Present pitch to other student(s), feedback on pitch	Confidence and control	Building self-efficacy and decision making	Workshop 1	Workshop	–
	Determining key personality, motivators & team role factors	Curiosity	Exploration (self)	–	–	Workshop
Knowing the labor market	Searching vacancies with personal profile	Curiosity	Exploration (environment)	Workshop 2	Workshop	Workshop
	Discuss outcomes, problems and solutions of search	Control and confidence	Decision making and problem solving	Workshop 2	Workshop	Workshop
Home assignment	Write career plan	Concern	Planning career steps	Homework	Homework	Homework

5. Methods

5.1. Design

We compared four conditions in a three-wave quasi-field experiment among advanced university students. Three intervention groups underwent similar interventions but with different intensity levels, the control group did not. Career adaptive responses and adaptability were measured before (T1) and right after (T2) the interventions (or with no intervention in-between in the case of the control group) with usually one week (two weeks in the case of the two workshops intervention) in between. After six months, students replied to the questionnaire again (T3), besides reporting information on their career success: employment status, and, if applicable, perceived fit, career growth and career satisfaction.

5.2. Participants and procedure

Participants were 471 university students in the Netherlands (78.6% female). Of these, 187 were 3rd year bachelor and 284 were master students. Regarding field of study, 64.26% studied psychology, 32.01% other social sciences, and 3.75% STEM-subjects, which is quite suitable since particularly students in the social sciences find it difficult to create a clear career profile (Eimer, Knauer, Kremer, Nowak, & Schröder, 2019). Participants were recruited through student boards, a university-wide labor market preparation week and a 3rd year career preparation program. The interventions were promoted to prepare students for the labor market. Participants signed up for one of pre-selected intervention dates or participated as part of their 3rd year study-program. We allocated students to intervention groups based on availability, with a maximum of 25 students in each workshop, although most workshops were much smaller (average: 14.2). The two workshops intervention started with 42 students (T1–T2), 23 (54.76%) of whom partook six months later (T3). The combined workshop intervention had 302 students at T1 and T2, 235 of whom took part voluntarily and 67 in the context of a mandatory career course. At T3, this intervention had 95 participants (31.25%) [68 voluntary (33.05%) and 17 mandatory (25.00%)[1]]. The short workshop intervention had 48 students at T1 and T2, and 24 (50%) at T3. A repeated measurement ANOVA (T1 vs T2) supported the assumption that participants who dropped out at T3 did not significantly differ in their developmental trajectory on either career adaptive responses or career adaptability from T1 to T2 from participants who also responded at T3. This was true both in the overall sample (career adaptive responses $\eta^2 = 0.001$, $p = 0.926$; career adaptability $\eta^2 = 0.087$, $p = 0.165$) and in any of the four subgroups addressed in Hypothesis 4 (career adaptive responses η^2 from 0.000 to 0.088, p from 0.317 to 0.981; career adaptability η^2 from 0.000 to 0.083, p from 0.171 to 0.942).

Control-group participants (79 students at T1 and T2, and 33 (41.72%) at T3) were recruited via a message on university-related social media, including the announcement of a €50-raffle. This approach ensured that control group participants did not know anything about the intervention groups, and avoided the issue that the methodologically ideal approach, an experimental group design, would have been either unethical (excluding interested students from the intervention) or not feasible (turning the control group into a waiting-control group instead). The prediction of first employment outcomes required an extended time lag during this sensitive transition time in students' lives. Administering an intervention to the control group before the completion of this transition would have undermined the study's purpose, administering it after the transition would have been too late for students' own interests.

5.3. Interventions

We now outline the interventions' structure, the link to career construction theory, and critical components of career interventions (Brown et al., 2003; Brown & Krane, 2000).

5.3.1. Two workshops intervention

The most intensive intervention combined preparatory online work and two workshops set a week apart (Table 1). In preparation, students created their personal online portfolio, stimulating self-exploration (curiosity). According to Savickas (2013), systematic exploration and reflection on exploratory experiences move people from naïve to knowledgeable, as they learn about their abilities, interests and values and how these fit to types of work. The portfolio surveyed students on their personality (following the Big 5 taxonomy; Goldberg, 1990), personal motivators (based on McClelland, 1985) and preferred team roles (based on Quinn, 1988). Students could also gather 360° feedback by inviting others to fill in the questionnaires. The personality and the personal motivator questionnaires have previously been formally accredited as reliable and conceptually valid by the COTAN, the Independent Dutch Testing Committee of the Dutch Psychological Association. Students received an elaborate overview with their personal scores for each questionnaire.

To ensure training integrity, the workshops followed a fixed structure outlined in a step-by-step instruction manual and a PowerPoint presentation. The first workshop (2.5 h) started with introducing the trainers, students, and the workshop itself. To enhance students' career concern (Savickas, 2013), trainers emphasized the relevance and usefulness of a good career preparation and students reflected upon their own state of preparedness. Students then reflected on the results of the questionnaires, summarized the outcomes and answered the questions ‘Who am I?’, ‘What are my qualities?’, and ‘What are my ambitions?’ (self-exploration). By doing so, students could form a clear personal profile.

[1] Whether students participated voluntarily or mandatorily in the intervention had no significant effect on results. Please see online Appendix C for more information.

Next, students wrote a personal pitch, aiming to enhance career curiosity and control. Savickas (2013) argues that control arises from solving problems and recognizing that one can be useful and productive. In their pitch, students were guided towards making deliberate and organized choices by answering questions such as 'What did you recognize in the results of the questionnaires and what did you not recognize?', 'What are your strengths?' and 'What do you look for in your future job?' The final step of the first workshop aimed at enhancing control and confidence (Savickas, 2013). Students performed their pitch in front of the group and provided each other with feedback (Brown et al., 2003). This way, students could develop a feeling of self-efficacy concerning their ability to present themselves to employers.

The second workshop (1.5 h) a week later served students' environmental exploration. Students used the Vacancy Seeker, a representation of all online vacancies in the Netherlands, which allows job-seekers to search for vacancies not only by job title, but also based on personal characteristics, incentives and roles (i.e., information students had gained from their self-exploration), thus allowing for a more self-directed environmental exploration. Moreover, the Vacancy Seeker provides in-session opportunities to gather information on the world of work and on specific career options (Brown et al., 2003). Students used the Vacancy Seeker for 45 min, evaluating the match of each vacancy found on a 1 to 5 scale as to create a clear overview of suitable vacancies. At the end of the workshop, they discussed and solved anticipated problems concerning the next steps in their career preparation (i.e. by using and discussing the results of the Vacancy Seeker; control and confidence). After that, students filled in the career adaptability questionnaire (T2). The total trainer investment was 4 h.

Finally, students were asked to write a career plan in their online portfolio to translate workshops' outcomes into concrete action plans (concern) and to transfer insights to future situations (e.g. Martin, 2010). After the training, students kept their access to the online portfolio and Vacancy Seeker for 12 months.

5.3.2. Combined workshop intervention

This intervention combined the preparatory online work with one workshop (2.5 h) that presented the same material as the two workshops intervention in a more condensed format (Table 1). Students filled in the same questionnaires and the workshop content was similar, except that less time was spent on explaining and reflecting on the different exercises, and students did not present their pitch to the entire group, but only to one fellow participant. That way, individualized interpretation and feedback was still included (Brown et al., 2003). The total trainer investment was 2.5 h.

5.3.3. Short workshop intervention

This intervention was the least intensive and contained one workshop similar to the second workshop of the two workshops intervention. Different from the two previous interventions, students did no preparatory work and gained access to the online portfolio only at the start of the workshop. Instead of filling in detailed scales in the online portfolio and reflecting upon their results, students ad hoc estimated their personal profile by selecting the most relevant personality characteristics, motivation and team roles within the search option of the Vacancy Seeker (self-exploration; curiosity). The Vacancy Seeker then selects vacancies that match the selected profile. After the intervention, students could fill in the self-exploration questionnaires individually without guidance, which about half of them did to some extent, but never as intensively as students form the other groups.

5.3.4. Career adaptability and adaptive responses

The interventions followed Savickas' (2005) recommendations on how to build and use each career adaptability resource (Table 1):

5.3.4.1. Career control. students were guided towards deliberate and organized choices by writing and performing their personal pitch. They could work with the online portfolio and Vacancy Seeker autonomously in order to get a clear overview of their current situation and to empower them to make deliberate career choices and take independent career actions.

5.3.4.2. Career curiosity. In the two- and combined workshops, self-exploration via different questionnaires allowed students' insights in their personality, incentives and team roles. Moreover, during the pitch exercise in the two- and combined workshops, students reflected on the results of the questionnaires and subsequently wrote an abstract of the important findings. Environmental exploration via the Vacancy Seeker aimed at providing students of all three groups with insight in and knowledge of the current labor market.

5.3.4.3. Career concern. Students in all three interventions reflected on their state of preparedness, gained an overview of the status of their current career and ambitions for the future, and were encouraged to set up an action plan for their careers.

5.3.4.4. Career confidence. Is reflected in the entire online portfolio. Going through the steps in the portfolio highlights students' qualities, motivations and skills, which should also enhance their career confidence (without guidance for the short workshop intervention). Also the pitch exercise in the two- and combined workshop interventions aimed at enhancing students' confidence on how to present themselves.

5.3.5. Critical components

In addition to its conceptual focus on career adaptability, interventions included the five critical components for effective career interventions identified by Brown and Krane (2000) and Brown et al. (2003). (1) The two- and the combined workshop interventions included workbook and written exercises describing one's goals, plans and occupational analyses in the online portfolio and the

workshop. Students summarized their outcomes for each questionnaire, wrote a personal pitch (two- and combined workshop) or filled in their personal profile (short workshop) and optionally a career action plan (all interventions). (2) Individualized interpretations of the intervention material and personal feedback were included by providing outcome reports on each questionnaire and explaining how to interpret them (two- and combined workshop). For individualized feedback, students discussed with the trainer and with each other how their results fit different career paths. They could ask questions and were offered individual consultations for problematic outcomes during the session. (3) Students gathered information on the world of work and on specific career options via the Vacancy Seeker. (4) Trainers discussed role models who successfully coped with similar career transitions, and gave real life examples from their own career path and personal pitch. (5) Social support for students' career choices and plans was stimulated by students asking others in their network to provide them with online feedback on their career related qualities and with career related tips and suggestions. During the workshop, students also helped each other improve their pitch and career plans (two- and combined workshop).

5.4. Measures

Career adaptability was measured with the Dutch version (Van Vianen, Klehe, Koen, & Dries, 2012) of the Career Adapt-Abilities Scale (CAAS; Savickas & Porfeli, 2012). Students rated how strongly they believed that they could successfully perform the activities representing career control (e.g. "making decisions by myself"), curiosity (e.g., looking for opportunities to grow as a person), concern (e.g., preparing for the future), and confidence (e.g., overcoming obstacles). To meet reliability standards and to prevent multicollinearity, subscales were combined in one overall career adaptability scale (as also done by Savickas & Porfeli, 2012).

Career adaptive responses were assessed with previously published Dutch scales (Van der Horst & Klehe, 2019) on career decidedness (five items), self- (five items) and environmental exploration (four items), career planning (six items), and career self-efficacy (six items). In the current study, we combined these scales into one adaptive response measure.[2]

Job status was measured with the single item "Do you have a paid job?", given that this presents an objective outcome. Options were: yes (full- or part-time), no (i.e. no paid job).

Perceived fit was measured with Cable and DeRue's (2002) nine-item scale on person-organization fit (e.g., "My personal values match my organization's values and culture"), needs-supplies fit (e.g. "There is a good fit between what my job offers me and what I am looking for in a job") and demands-abilities fit (e.g. "The match is very good between the demands of my job and my personal skills"). To match the content of the e-portfolio, we added 3 items on the perceived fit between personality, motivation and team roles and the jobs found (*intervention fit*; e.g. "My current job matches well with my personal motivators").

Career growth was measured with Bedeian, Kemery, and Pizzolatto's (1991) three item scale (e.g. "I feel that my present job will lead to future attainment of my career goals").

Career satisfaction was measured with the item "I am satisfied with the success I achieved in my study and or career" (Greenhaus, Parasuraman, & Wormley, 1990), given that satisfaction can well be measured with single items (Wanous, Reichers, & Hudy, 1997)[2].

5.5. Analyses

Hypotheses 1 to 3 were tested via structural equation modelling (SEM) in MPLUS 8.3, using full information maximum likelihood (Muthén & Muthén, 1998–2017) to estimate the missing data and bootstrapping (10,000 draws), and with bias corrected confidence intervals to account for deviations from normality (Preacher & Hayes, 2008). In a classic two-step protocol, we first tested the measurement model, then the structural model (Anderson & Gerbing, 1988). The measurement model served to test whether the diverse career adaptive responses measured could indeed be combined onto a common factor without a loss of fit. For this purpose, we modelled career-adaptive responses as a second order factor underlying the five responses measured (planning, decidedness, self- and environmental exploration, self-efficacy). In order to keep a reasonable item-to-sample ratio, we followed the standard SEM-procedure to estimate latent variables via three item-parcels each (Hall, Snell, & Foust, 1999), building parcels with the item-to-construct balance method (Little, Cunningham, Shahar, & Widaman, 2002). Then, we tested Hypotheses 1 to 3 (Fig. 1).

Hypothesis 4 was tested via repeated measurement ANOVAs, expecting significant interaction effects between time (T1 versus T2 and T3) and group in that, compared to less intensive interventions, more intensive interventions to show stronger increases in career adaptive responses and career adaptability from the baseline measure T1 to later assessments.[3]

6. Results

Table 2 presents the variables' means, standard deviations, inter-correlations and internal consistencies. As the intervention groups scored lower than the control group on career adaptive responses ($F_{(1,\ 469)} = 12.846$, $p < 0.000$) before the intervention, we always controlled for students' starting level on the dependent variables in the following analyses.

The CFAs on the career adaptive responses suggested an acceptable fit across all measurement points (CFI = 0.907 at T1 to 0.946 at T3; RMSEA = 0.077 at T2 to 0.066 at T3; SRMR = 0.069 at T3 to 0.063 at T1). The mean factor loadings of the individual adaptive

[2] Please see Appendix A for a full presentation of the scales and the result of a supplementary 2-wave validation study that supported the scales to have good reliability, stability, and convergent validity.

[3] Please note that a similar ANOVA/ANCOVA based approach has also been undertaken to test Hypothesis 1a and b and 2 with conclusions largely aligning with those reported here. Online Appendix C provides further detail.

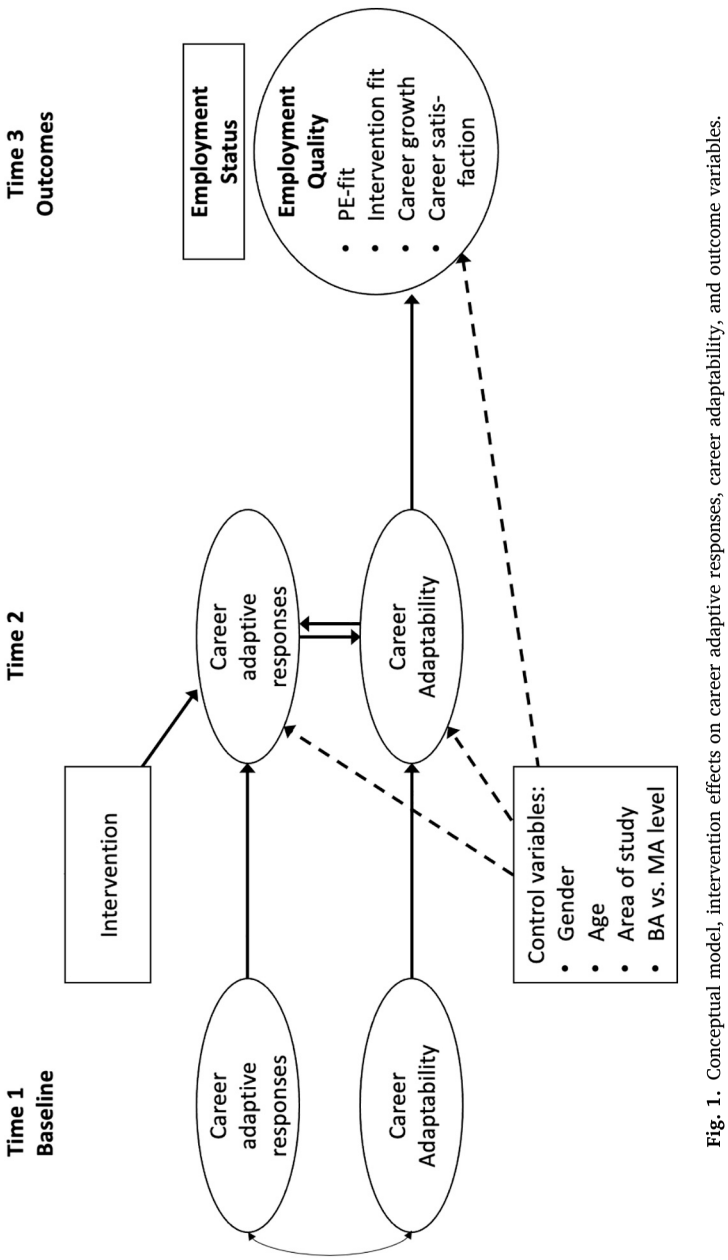

Fig. 1. Conceptual model, intervention effects on career adaptive responses, career adaptability, and outcome variables.

Table 2
Means, standard deviations, correlations and coefficient alphas (on the diagonal).

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	1 Gender	0.21	0.41	–																		
	2 Age	22.99	2.61	*0.16***	–																	
	3 Psy. or different study	0.59	0.49	*−0.14***	−0.08	–																
	4 Bachelor or master	0.67	0.47	0.07	*0.32***	*−0.14***	–															
	5 Dropout T3	0.37	0.48	*−0.10**	*0.12**	0.05	0.06	–														
	6 Intervention no/yes	0.83	0.37	0.01	*−0.10**	*0.17***	−0.05	−0.05	–													
T1	7 Career adaptability	3.88	0.36	−0.04	0.03	0.02	−0.09	0.01	−0.03	*0.78*												
	8 Car. adaptive responses	3.25	0.49	0.02	*0.10**	−0.05	−0.06	−0.01	*−0.16***	*0.57***	*0.88*											
T2	9 Career adaptability	3.97	0.32	−0.06	0.05	−0.02	−0.06	0.08	0.05	*0.61***	*0.42***	*0.80*										
	10 Car. adaptive responses	3.55	0.45	−0.03	*0.10**	−0.04	−0.02	−0.02	*0.11**	*0.46***	*0.64***	*0.60***	*0.88*									
T3	11 Career adaptability	3.99	0.37	−0.07	0.06	−0.09	0.01	–	0.03	*0.65***	*0.45***	*0.74***	*0.60***	*0.85*								
	12 Car. adaptive responses	3.56	0.51	−0.05	0.10	−0.07	0.14	–	0.04	*0.48***	*0.59***	*0.62***	*0.68***	*0.69***	*0.90*							
	13 Job status	0.20	0.40	−0.08	*0.19**	−0.14	*0.25***	–	−0.08	0.03	0.09	*0.16**	0.12	0.10	*0.21***	–						
	14 PO fit	3.50	0.97	0.05	0.01	0.01	0.11	–	0.02	0.09	0.16	*0.19**	0.12	*0.24***	*0.29***	*0.32***	*0.86*					
	15 NS fit	2.67	1.19	−0.01	0.06	0.02	0.09	–	0.03	0.15	*0.28***	*0.31***	*0.28***	*0.34***	*0.45***	*0.39***	*0.57***	*0.90*				
	16 DA fit	3.01	1.08	−0.08	0.08	0.02	0.12	–	−0.03	0.07	0.16	*0.21**	0.12	*0.21**	*0.27***	*0.40***	*0.49***	*0.66***	*0.86*			
	17 Intervention fit	3.27	1.06	−0.06	0.02	0.05	0.06	–	0.14	0.10	0.17	*0.25***	0.22*	*0.31***	*0.36***	*0.33***	*0.77***	*0.77***	*0.63***	*0.84*		
	18 Career growth	3.75	1.11	−0.06	−0.03	0.08	−0.06	–	−0.03	*0.21***	*0.24***	*0.19**	*0.16**	*0.33***	*0.21***	*0.27***	*0.49***	*0.61***	*0.63***	*0.57***	*0.88*	
	19 Career satisfaction	3.75	1.10	−0.04	*−0.25***	−0.06	−0.13	–	−0.06	*0.27***	*0.29***	*0.24***	*0.19**	*0.37***	*0.25***	0.14	*0.31***	*0.40***	*0.32***	*0.36***	*0.56***	–

T1 and T2 $N = 471$, T3 $N = 136$ for PO fit, NS fit, DA fit, Intervention fit $N = 169$ for Job status, Career growth and Career satisfaction.
* Correlation significant at 0.05.
** Correlation significant at 0.01.

responses onto the common adaptive response factor ranged from 0.682 at T2 to 0.739 at T3. Modelling the one or two career adaptive responses with the weakest loadings onto the overall factor as being separate from but correlated with this common factor did not significantly improve the model's fit ($\Delta X^2 < 0.30$, *ns*; $\Delta CFI < 0.001$), suggesting that the use of a common career adaptive response factor for the purpose of our analyses is suitable.[4]

Hypothesis 1 proposed that participation in the interventions would raise students' career adaptive responses (H1a) and career adaptability (H1b) with the effect on career adaptability being mediated by the interventions' effect on career adaptive responses (H1c). SEM supported these assumptions. More specifically: taking part in the interventions was positively linked to students' career adaptive responding at T2 ($\gamma = 0.199$ to 0.201, $p < 0.001$), which in turn was positively linked to their career adaptability at T2 ($\beta = 0.235$ to 0.250, $p = 0.001$), with the indirect path being significant (0.051 to 0.055; 95% confidence interval reaching from 0.018 to 0.094; Fig. 2; Table 3). These analyses controlled for both career adaptive responding and career adaptability at T1 and allowed for a link from career adaptability at T2 to career adaptive responding at T2, given career construction theory's theorem that students' adaptability would influence their adaptive responses (Savickas, 2005, 2013). Further including any of the proposed control variables gender, age, study-major, and level of study did not alter any of these effects (Table 3, bottom). For comparison, adding a direct path from the interventions to students' career adaptability at T2 did not improve the models' fit ($\Delta X^2_{(df=1)} = 1.00$ to 1.34, *ns*), with the new path from the interventions to career adaptability never reaching significance.[5] Overall, results thus support Hypothesis 1 with the interventions enhancing students' career adaptive responses and via those their adaptability. See Fig. 3 for a graphic illustration of these effects. While the control group tended to start higher than the intervention groups on both, adaptive responses and career adaptability, there was a crossover effect in that the intervention groups ended up scoring higher on these variables directly after the intervention.

Hypothesis 2 proposed the interventions' effects to hold over time. We included T3 career adaptive responses and career adaptability as outcome variables in the SEM, assuming T3 scores to be influenced by their respective T2 scores as well as by career adaptability at T2 (Savickas, 2005, 2013). Results suggest considerable stability of both adaptive responses ($\beta = 0.525$, $p < 0.001$) and particularly for career adaptability ($\beta = 0.865$, $p < 0.001$) across half a year, with the overall indirect effects of the interventions on T3 adaptive responses and adaptability being larger than zero. Overall, these analyses thus support Hypothesis 2.

Hypothesis 3 proposed that via their effects on students' career adaptability, the interventions would (a) help students find employment and (b) foster employment quality. Results (Table 3) confirmed the effect of students' career adaptability at T2 on both their employment status ($\beta = 0.157$, $p = 0.039$) and on the quality of their employment at T3 ($\beta = 0.184$ to 0.298, $p < 0.01$, depending on indicator). The indirect effects were larger than zero. Adding career adaptive responding at T2 as an alternative path to the outcome variables did not improve model fit, nor was this path significant.[5] In sum, results thus supported Hypothesis 3.

Hypothesis 4a and b proposed that intervention intensity (more hours, more sessions) would foster intervention effectiveness immediately after the intervention (T2) and half a year later (T3). Thus, the two workshops intervention should be more effective than the combined workshop intervention, which in turn should outperform the short workshop intervention. We tested this hypothesis with two series of repeated measurement ANOVAS, examining either T1 and T2 (H4a) or T1, T2 and T3 (H4b) as the within-subject variable and always comparing two of the three intervention groups with each other (between subject variable). We expected a significant interaction effect between group and time in that the more intensive intervention should show a steeper increase in post-measures (T2 or T3) from the pre-measure (T1).

Results of both series of ANOVAS partially supported Hypothesis 4 (Table 4; Fig. 3). On the short term (T2; H4a), the two workshops intervention indeed outperformed the combined workshop intervention on both career adaptability and adaptive responses, yet it only outperformed the short workshop intervention on career adaptive responses, not on career adaptability. Unexpectedly, also the short workshop intervention produced better results than the combined workshop intervention on career adaptability. This means that the two- and the short workshop interventions both yielded better short-term results than the combined workshop intervention. Regarding the long-term effects (T3; H4b), the two workshops intervention outperformed the combined workshop intervention marginally on career adaptability and on career adaptive responses, and again outperformed the short workshop intervention on career adaptive responses. The short workshop intervention did not produce better results compared to the combined workshop intervention on either outcomes measure. Overall, Hypothesis 4 can thus only be supported tentatively for the most intensive intervention (two workshops intervention) in comparison with the other two interventions.[5]

7. Discussion

Actively managing and adapting one's career matters for a successful school-to-work transition and beyond. With this study we answer to the call for more research on effective and scalable career interventions that help students prepare for this transition (Whiston et al., 2017) by fostering students' career adaptive responses and adaptability (Savickas, 2005, 2013). The design of the interventions combined online tools with one or two compact workshops, building on earlier conceptual (Savickas, 2005, 2013) and practical (Koen et al., 2012) work on career construction theory (Savickas, 2005, 2013). We studied the interventions' effects on the short and longer term, as well as on job status and employment quality in the first employment, answering to the call for more research

[4] More detailed statistical results on these analyses are available from the second author upon request.

[5] Results of the repeated measures ANOVA's largely also held for each of the adaptive responses tested separately. Exceptions are the prediction of career self-exploration at T1–T2 in the combined workshop intervention and at T1–T2–T3 for self-exploration for the combined- and short workshop interventions, and for environmental exploration and self-efficacy for the short workshop intervention. More information is available from the first author upon request.

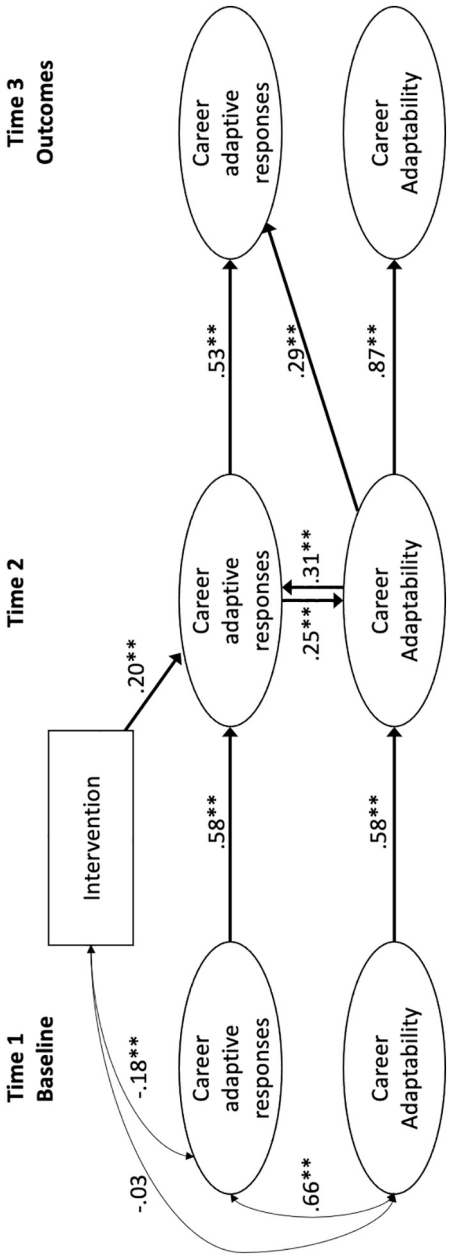

Fig. 2. Exemplary results predicting career adaptive responses and career adaptability at Time 3 (illustrative of first line of Table 3).

Table 3
SEM results, split by outcome variables. Upper half presents original results, lower half results after including control variables.

Outcome variable T3	Fit						Pathweights								Indirect effect intervention → T2 CA(Hypothesis 1c)			Indirect effect intervention → T3 outcome (Hypotheses 2, 3)		
	Chi^2	df	CFI	TLI	RMSEA (90% CI)	SRMR	Interv. → T2 CaR		T2 CaR → T2 CA		T2 CA → T2 CaR		T2 CA → T3 outcome							
							γ	p_γ	β	p_β	β	p_β	β	p_β	Std. effect	Lower 2.5%	Upper 2.5%	Std. effect	Lower 2.5%	Upper 2.5%
Career ada. response & career adaptability	322.55	141	0.962	0.954	0.052 (0.060)	0.044	0.199	0.000	0.250	0.000	0.308	0.000	CaR → CaR 0.525	0.000				0.129	0.082	0.183
													CA → CaR 0.293	0.001						
													CA → CA 0.865	0.000	0.055	0.022	0.094	0.047	0.018	0.082
Job status	158.28	70	0.976	0.969	0.052 (0.062)	0.039	0.201	0.000	0.235	0.001	0.305	0.000	0.157	0.039	0.051	0.018	0.092	0.008	0.001	0.022
Person environment-fit	185.89	96	0.977	0.972	0.045 (0.054)	0.045	0.201	0.000	0.237	0.001	0.303	0.000	0.298	0.000	0.051	0.018	0.093	0.015	0.005	0.034
Intervention fit	189.41	96	0.976	0.970	0.045 (0.055)	0.049	0.201	0.000	0.237	0.001	0.304	0.000	0.250	0.004	0.051	0.018	0.093	0.013	0.003	0.031
Career growth	201.26	96	0.974	0.967	0.048 (0.058)	0.051	0.201	0.000	0.236	0.001	0.303	0.000	0.184	0.006	0.051	0.018	0.092	0.009	0.002	0.023
Career satisfaction	159.65	70	0.976	0.969	0.052 (0.063)	0.042	0.201	0.000	0.236	0.001	0.302	0.000	0.255	0.000	0.051	0.018	0.093	0.038	0.004	0.029
Including control variables (gender, age, field of study, Bachelor vs. Master level)																				
Career ada. response & career adaptability	398.71	177	0.954	0.941	0.052 (0.058)	0.042	0.214	0.000	0.252	0.000	0.301	0.000	CaR → CaR 0.524	0.000				0.138	0.088	0.195
													CA → CaR 0.287	0.001						
													CA → CA 0.857	0.000	0.058	0.023	0.102	0.050	0.020	0.080
Job status	224.63	102	0.967	0.954	0.051 (0.059)	0.033	0.235	0.000	0.234	0.001	0.302	0.000	0.141	0.057	0.055	0.019	0.091	0.008	0.000	0.021
Person environment-fit	261.34	136	0.969	0.958	0.044 (0.052)	0.041	0.218	0.000	0.236	0.001	0.300	0.000	0.301	0.000	0.055	0.019	0.100	0.017	0.005	0.037
Intervention fit	270.87	136	0.966	0.955	0.046 (0.054)	0.043	0.216	0.000	0.237	0.001	0.301	0.000	0.252	0.005	0.055	0.019	0.100	0.014	0.003	0.034
Career growth	275.18	136	0.966	0.955	0.047 (0.055)	0.044	0.218	0.000	0.236	0.001	0.300	0.000	0.182	0.009	0.055	0.019	0.100	0.010	0.002	0.025
Career satisfaction	230.40	102	0.966	0.952	0.052 (0.061)	0.038	0.218	0.000	0.237	0.001	0.299	0.000	0.265	0.000	0.056	0.020	0.100	0.015	0.005	0.031

Note. CaR = career adaptive response; CA = career adaptability.

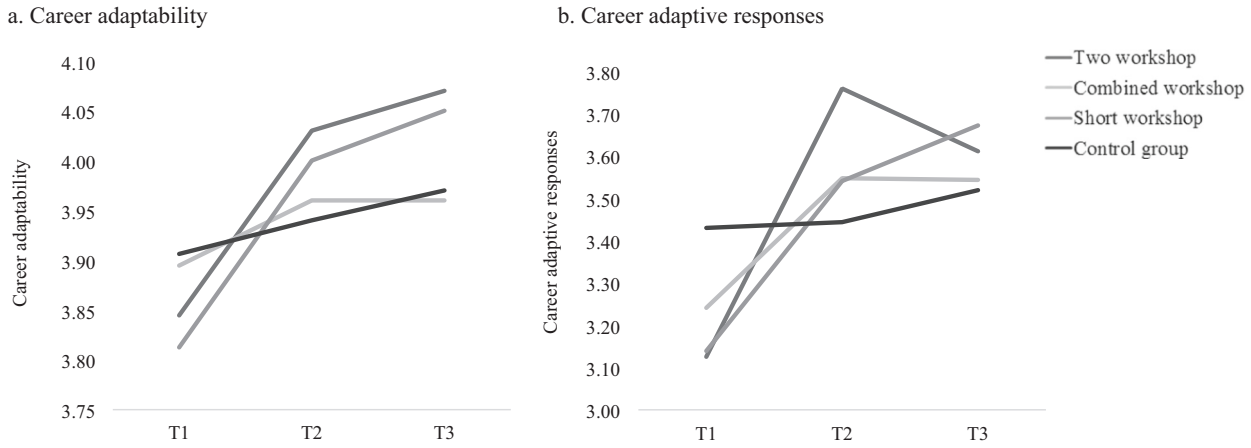

Fig. 3. Graphic representation of career adaptability (a) and career adaptive responses (b) at pre-training (T1), post-training (T2) and follow-up measurement for the intervention groups and the control group (T3).
Note. Sample sizes change between measurement times due to sample attrition.
T1–T2: $N_{twoworkshop} = 42$, $N_{combinedworkshop} = 302$, $N_{shortworkshop} = 48$, $N_{controlgroup} = 79$.
T3: $N_{twoworkshop} = 23$, $N_{combinedworkshop} = 95$, $N_{shortworkshop} = 24$, $N_{controlgroup} = 33$.

addressing long-term effects and outcome variables (Savickas et al., 2009, p. 248; Whiston et al., 2003, 2017).

Results showed that students' career adaptive responses and – via those – adaptability can be trained with rather short, partly web-based interventions, with effects lasting up to six months. Via career adaptability, the interventions also fostered the likelihood and quality of students' first employment. Different from expectations, results regarding the interventions' intensity were mixed, however, with the most intensive intervention indeed outperforming the two less intensive ones, yet followed in effectiveness by the supposedly least intensive intervention format. In summary, results showcase the usefulness of short theory-grounded interventions for building career adaptability and for finding quality employment.

7.1. Conceptual contributions

The current study makes four conceptual contributions. First, interventions practicing career adaptive responses (Savickas, 2013) indeed led to students perceiving themselves as more adaptable and showing more adaptive responses even half a year after the interventions. This implies that it takes very little investment in terms of theory-based intervention to have lasting effects on both career adaptability and adaptive responses. Further, results confirm that effects on career adaptability are indirect by their effects on career adaptive responses. While different from regular presentations of the career adaptability framework, this finding stands well in line with Savickas' (2005, 2013) theorizing on how career adaptability comes about. It is also relevant, as adaptive responses are actually what is being trained during interventions — with these enacted responses then strengthening students' perceived resources (adaptability), which then account for the interventions' longer-term effects. Third, the interventions led to students finding better quality employment, predicted by a rise in their career adaptability. While generally assumed, this mechanism had not been shown before (cf. Koen et al., 2012) and again supports the career adaptability framework (Savickas, 2013). Finally, the study adds to research on intervention intensity effects (Whiston et al., 2003, 2017). While the most intensive intervention (two workshops) generally performed best, the least intensive intervention (short workshop) did not fare badly, either, supporting Whiston et al.'s (2003) suggestion that intensity in terms of hours invested is not the key driver of intervention effectiveness.

7.2. Practical implications

A rapidly changing world of work emphasizes the need to be ready to adapt (Savickas, 2013). The school-to-work transition is an important period to develop the necessary resources, as the university is often the last structured educational setting that students encounter. From the moment they leave, students are mostly on their own in managing their careers. As a first implication, the current study presented effective yet scalable interventions that can help students prepare for this task and that can be made available to large groups at the same time. This makes it possible and affordable to prepare not only the gifted few in talent programs or students who face special challenges, but all students who are about to enter the labor market.

Second, the interventions presented obtained similar effects as reported for a more time intensive intervention (Koen et al., 2012), but with less trainer investment (2 to 4 h, compared to a minimum of 8.5 h in earlier research). While we do not know what caused the shorter interventions to work just as well, there are several possible explanations. One is that the ability to outsource certain trainer tasks to the online tools (such as a structured self-assessment) made the overall interventions more efficient. Another explanation, however, would be in line with results to Hypothesis 4 that more simply is not necessarily better.

Table 4
Repeated measures analyses of variance (ANOVAs) for T1–T2 and for T1–T2–T3, comparing interventions (Hypothesis 4).

	Group	Dependent variable	Time					Group					Interaction time * Group				
			F	df1	df2	*p*	η^2	F	df1	df2	*p*	η^2	F	df1	df2	*p*	η^2
T1–T2	Two vs combined workshop	Career adaptability	26.73	1	342	0.00	0.072	0.07	1	342	0.93	0.000	4.43	1	342	0.04	0.013
		Career adaptive responses	227.96	1	342	0.00	0.400	0.52	1	342	0.47	0.002	27.39	1	342	0.00	0.074
	Combined vs short workshop	Career adaptability	32.55	1	348	0.00	0.086	0.30	1	348	0.59	0.001	5.83	1	348	0.02	0.016
		Career adaptive responses	143.17	1	348	0.00	0.293	0.25	1	348	0.39	0.002	2.54	1	348	0.11	0.007
	Two vs short workshop	Career adaptability	30.20	1	88	0.00	0.256	0.29	1	88	0.59	0.003	0.01	1	88	0.92	0.000
		Career adaptive responses	142.18	1	88	0.00	0.618	1.54	1	88	0.22	0.017	7.15	1	88	0.01	0.075
T1–T2–T3	Two vs combined workshop	Career adaptability	15.86	1.87	216.49	0.00	0.120	0.41	1	116	0.53	0.003	3.10	1.87	216.49	0.05	0.036
		Career adaptive responses	53.23	1.89	219.39	0.00	0.315	0.32	1	116	0.57	0.003	2.52	1.89	219.39	0.01	0.045
	Combined vs short workshop	Career adaptability	11.69	1.87	220.63	0.00	0.091	0.03	1	117	0.85	0.000	2.16	1.87	220.63	0.12	0.018
		Career adaptive responses	29.51	1.89	221.34	0.00	0.201	0.82	1	117	0.37	0.007	0.33	1.89	221.34	0.71	0.003
	Two vs short workshop	Career adaptability	18.77	1.74	78.24	0.00	0.294	0.25	1	45	0.62	0.006	0.41	1.74	78.24	0.64	0.009
		Career adaptive responses	40.15	2	90	0.00	0.472	0.09	1	45	0.77	0.002	5.08	2	90	0.01	0.101

T1–T2: $N_{twoworkshop} = 42$, $N_{combinedworkshop} = 302$, $N_{shortworksop} = 48$, $N_{controlgroup} = 79$.
T1–T2–T3: $N_{twoworkshop} = 23$, $N_{combinedworkshop} = 95$, $N_{shortworksop} = 24$, $N_{controlgroup} = 33$.

7.3. Limitations and directions for future research

Given that an experimental waiting control group design had not been feasible, this study presents a quasi- rather than a true experiment. The prime consequence is that the control group started out with slightly higher scores on career adaptive responses than the intervention groups. Yet, we do not think this to threaten the validity of our results as we controlled for students' T1 value and as results remained relatively stable across conditions, with even the least intensive intervention rendering meaningful and significant results. Also, rerunning analyses on a more restricted intervention group that was essentially parallel to the control group in terms of starting values rendered comparable results. Finally, while both career adaptability and adaptive responses showed considerable stability across the half year between T2 and T3, ANOVAs revealed cross-over effects from T1 to T2 (Fig. 3), i.e., the level of career-adaptability and adaptive responses achieved in the intervention groups repeatedly surpassed that of the control group at T2, suggesting that results cannot be explained by students' starting level but are truly an effect of the intervention group.

Further, like Koen et al. (2012), the current study focused on Dutch university students. Different countries provide different demands and opportunities to develop and express adaptability, causing national variances in career adaptability (Savickas & Porfeli, 2012). The effects of interventions may thus differ in other national contexts or economic climates. They may also differ for other populations such as workers facing restructuring, downsizing, relocation or unemployment, or workers with special conditions or needs such as handicapped job seekers or job seekers with an immigrant background.

Further, while we systematically compared interventions of different intensity, we did not compare the impact of separate exercises. Compared to the other interventions, the combined workshop intervention – the least effective of the three intervention setups – had less emphasis on the search for vacancies, as this was the last assignment at the end of a dense 2.5-hour session, whereas the other two interventions both had one workshop dedicated to seeking vacancies. In addition, the short workshop intervention only had a brief exercise on constructing a personal profile, but also allowed students to engage in in-depth self-exploration after the workshop by giving them access, albeit unguided, to the same online portfolio used in the two other interventions. Administered for fairness' sake, this decision may somewhat reduce long-term differences between interventions.

This raises the question as to whether our approach to focus on students' insight in their personal profile and ability to present themselves before seeking for vacancies to match their profile to career opportunities, is truly the ideal order. Environmental information may help students create a more accurate and clear picture of what they find important and what is realistic. This information might help them set up a more meaningful personal profile and feel more confident in presenting this profile. Literature on identity formation (Ashforth & Schinoff, 2016; Cruess et al., 2015; Meijers, 1998) suggests that identities are formed not in open space, but in constant comparisons with the requirements of the context. Therefore, a different intervention setup could lead to even better results. For example, it may be the time for reflection between workshops that is particularly relevant, or alternatively, it may actually help to have more emphasis on exploring available vacancies, before setting up a profile.

A final direction for future research may address the distinction between workers as actors, agents, and authors (Savickas, 2013). The actor perspective implies following given scripts. Yet, at some point, most people self-extend and develop their own goals to strive for as active agents — the level of career adaptability and adaptive responses. Finally, people become authors of their careers, reflecting on, making sense of, and explaining their autobiography as to pattern their experiences into a meaningful career story (McAdams & Olson, 2010; Savickas, 2013). The current study addresses career interventions on the agent-level. In line with career construction theory, future research may also attempt scalable interventions that focus on people as authors by helping them to construct a personal career narrative. The counseling model for career construction offers a set sequence of questions and analysis during multiple one on one coaching sessions (Savickas, 2005). Many studies show the positive effect of one-on-one career construction coaching (e.g., Hartung & Vess, 2016; Lengelle, Meijers, & Hughes, 2016; Pouyaud, Bangali, Cohen-Scali, Robinet, & Guichard, 2016; Reid, Bimrose, & Brown, 2016; Taylor & Savickas, 2016), but there are not many scalable interventions that foster the development of the career narrative. Future research may address if it is possible to construct and validate an effective and scalable interventions that focus on the worker as an author.

8. Conclusions

Results of this study show that the combination of online- and structured group interventions can help student increase their career adaptability and adaptive responses and thereby facilitate a successful school-to-work transition. By combining these two types of interventions, we have designed an effective, scalable and effective approach that can be made available to large groups of students at the same time. In times where students struggle to find suitable work and where job seekers have to be more self-directed and adjustable than ever, this new type of intervention setup can be very relevant to students and to practitioners that aim to help students to make a successful transition to the labor market.

CRediT authorship contribution statement

Anna C. van der Horst: Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration, Funding acquisition. **Ute-Christine Klehe:** Conceptualization, Methodology, Validation, Formal analysis, Resources, Writing – original draft, Writing – review & editing, Visualization, Supervision, Funding acquisition. **Veerle Brenninkmeijer:** Writing – review & editing, Supervision. **Anne Coolen:** Methodology, Software, Investigation, Data curation.

Declaration of competing interest

Anna van der Horst and Anne Coolen are employed by Eelloo. Eelloo was involved in this research project by providing the technology (e-portfolio, questionnaires and vacancy seeker) that was used during the intervention that is described in the study.

Appendix. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jvb.2021.103581.

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