Vocational identity of at-risk emerging adults and its relationship with individual characteristics

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Abstract

Vocational identity is a prerequisite for enhancing societal inclusion of at-risk emerging adults. School curricula and rebound programs need insights into individual differences of these youths to effectively foster their vocational identity. Identifying three aspects of vocational identity, a questionnaire study among at-risk emerging adults in The Netherlands ($N = 996$) examined the relationship between clusters of demographic, personality, self-sufficiency, self-competence, and school engagement characteristics and vocational identity performing blockwise entry analyses. Largest proportions of variance were explained by personality traits and, to a lesser extent, motivation, resilience, and valuing school outcome. These malleable characteristics offer opportunities for interventions.

Keywords Vocational identity · At-risk emerging adults · Individual characteristics

Résumé

Identité vocationnelle d'adultes émergents à risque et sa relation avec des caractéristiques individuelles. L'identité vocationnelle est un prérequis pour augmenter l'inclusion sociétale d'adultes émergents à risque. Les curriculums scolaires et les programmes de rattrapages ont besoin d'informations sur les différences individuelles de ces jeunes pour pouvoir nourrir efficacement leur identité vocationnelle. Identifiant trois aspects de l'identité vocationnelle, un questionnaire d'étude auprès d'adultes émergents à risque aux Pays-Bas ($N = 966$) a examiné la relation entre des groupes de caractéristiques démographiques, de personnalité, d'auto-suffisance, de compétences personnelles, d'engagement scolaire, et d'identité vocationnelle avec des analyses d'entrée par bloc (*blockwise entry analyses*). La plus grande proportion

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de variance a été expliqué par la personnalité et, dans une moindre mesure, par la motivation, la résilience, et le fait de donner de la valeur aux résultats scolaires. Ces caractéristiques malléables offrent des opportunités d'intervention.

Zusammenfassung

Berufliche Identität gefährdeter Adoleszenter und ihre Zusammenhänge mit individuellen Merkmalen. Berufliche Identität ist eine wichtige Voraussetzung für die gesellschaftliche Integration von gefährdeten Adoleszenten. Schulcurricula und Resilienz-Programme benötigen Erkenntnisse hinsichtlich den individuellen Unterschieden dieser Jugendlichen, um ihre berufliche Identität effektiv zu entwickeln. Eine Fragebogenstudie unter gefährdeten Adoleszenten in den Niederlanden (N=996) untersuchte mittels Clusteranalyse die Beziehung zwischen den Merkmalen Demographie, Persönlichkeit, Selbständigkeit, Selbstkompetenz, schulischem Engagement und beruflicher Identität. Hierbei konnten drei Cluster identifiziert werden. Die größte Varianzaufklärung wurde durch Persönlichkeitsmerkmale und in geringerem Maße durch Motivation, Resilienz und Bewertung der schulischen Leistung erreicht. Diese formbaren Merkmale bieten Möglichkeiten für Interventionen.

Resumen

La identidad vocacional de los adultos emergentes en riesgo y su relación con características individuales. La identidad vocacional es un requisito previo para mejorar la inclusión social de adultos emergentes en riesgo. Los curricula académicos y los programas de recuperación necesitan prestar atención a las diferencias individuales de estos jóvenes para fomentar su identidad vocacional de un modo efectivo. Identificando tres aspectos de la identidad vocacional, un estudio llevado a cabo mediante cuestionarios entre adultos emergentes en riesgo en los Países Bajos (N=996) examinó la relación entre *clusters* (grupos) de características demográficas, de personalidad, auto-suficiencia, auto-competencia, y compromiso académico y la identidad vocacional mediante análisis de entrada *blockwise* (análisis de regresión de bloques por pasos). Las proporciones más grandes de varianza fueron explicadas por los rasgos de personalidad y, en menor medida, por la motivación, la resiliencia, y la valoración del resultado académico. Estas características maleables ofrecen oportunidades para distintas intervenciones.

Introduction

In modern Western society, work is understood to be not only a necessary source of income, but also a condition for inclusion and quality of life, and a means of self-expression through one's identity (Christiansen, 1999). For at-risk emerging adults, obtaining a formal qualification is helpful in improving the chances of employment and reducing risks of long-lasting unemployment, societal exclusion, and drifting into criminality (Bäckman & Nilsson, 2016; Lochner, 2011). Essential for work and, in this line, income and inclusion, is acquiring a vocational identity, which is understood as the realization of an increasingly stable conceptualization of one's own

vocational interests, talents, and goals (Holland, Daiger, & Power, 1980). Vocational identity is acknowledged to be crucial in educating emerging adults. At-risk emerging adults in The Netherlands are a heterogeneous group of young people, of whom some attend a school at the entry training level, the lowest level of senior secondary vocational education in The Netherlands (see block right corner of "Appendix 1" which provides an overview of the Dutch educational system), others attend a rebound program to prepare them to rejoin this level of secondary vocational education, and others look for appropriate education or work. They may be burdened by risks of a personal or social nature, such as deprived living conditions, debts, drug abuse, young parenthood, and low socioeconomical levels of parents (cf. Brahm, Euler, & Steingruber, 2014). Because graduation forms a serious challenge for some of the at-risk emerging adults, schools not only concentrate on qualifications, but also on preparing their students for career trajectories as assistant workers conducting appropriate job behavior. Schools therefore explicitly expend efforts to foster vocational identity.

Conceptualizations of vocational identity

Vocational identity is of value in creating and realizing career opportunities and aspirations (Ashforth & Fugate, 2001), is positively associated with career-related skills, such as career exploration, career decision-making and self-efficacy (Gushue, Scanlan, Pantzer, & Clarke, 2006), provides a framework for vocational goals, and helps emerging adults to cope with career-related stress and challenges (Skorikov & Vondracek, 2012).

Vocational identity also acts as a substantial source of meaning-making, well-being and mental health during adolescence (de Goede, Spruijt, Iedema, & Meeus, 1999; Meeus, Deković, & Iedema, 1997). It is understood to be an important predictor of success during the transition from school to work (Lapan, 2004), especially for deprived adolescents (Diemer & Blustein, 2006). Although much is known about the construct of vocational identity and what it entails, not much is known about which individual characteristics of at-risk emerging adults are related to vocational identity. These insights are necessary in order to know how to adjust practices dedicated to optimizing vocational identity among at-risk emerging adults.

Though conceptualizations of vocational identity slightly vary in whether it can be influenced, the notion of vocational identity as a person's clear and stable picture of goals, interests and talents with regard to career is widely accepted (e.g. Flum & Blustein, 2000; Turner et al., 2006). Due to increasingly uncertain working conditions and circumstances, continuous and active agency is assumed to be needed for a person to adjust to a context of rapid changes (Blustein, 2013; Brown & Lent, 2016). The self-perceived abilities, interests, values, self-efficacy beliefs and aspirations (Vondracek & Skorikov, 1997), connected to work domains and roles (Baumeister, 1999), enables a prospective employee to answer three main questions with respect to work: (1) *Who am I*?, (2) *Who do I want to be*?, and (3) *Am I able to get there*? (Fugate, Kinicki, & Ashforth, 2004, p. 17).

The *Who am I*? question aims to discover vocational strengths, talents, capabilities and possibilities and implies recognizing one's own individual talents. Asking *Who do I want to be*? means considering vocational ideas, interests, and aspirations leading to possible goals or outcomes of working futures and is regarded as career exploration. The transition from ideas to realization requires special attention, since many emerging adults hold unrealistic images of their opportunities and perspectives. They tend to overestimate financial rewards, set high value on status-expressing properties, and underestimate necessary efforts (van Zenderen, 2011). *Am I able to get there*? expresses a question into expectations of successful performance and reflects work habits and values. Vocational self-efficacy is the customized version of Bandura's self-efficacy (2006), and expresses a student's belief that he or she is or is not able to successfully perform the duties required for an occupation (Ji, Lapan, & Tate, 2004). The answers to the three main questions can be conceived as vocational self-image (Who am I?), vocational future image (Who do I want to be?) and vocational self-efficacy (Am I able to get there?) as conceptual components of vocational identity. We assume vocational identity to be of value in general and particularly for at-risk emerging adults.

Individual characteristics related to vocational identity

We used a grouping of individual characteristics related to vocational identity to distinguish the extent to which educational or rebound programs can influence them. Five clusters were formed, based on empirical studies as explained below: (1) demographics, (2) personality, (3) self-sufficiency, (4) self-competence, and (5) school engagement.

Studies which report gender differences in vocational identity vary in the extent to which males and females diverge. Skorikov and Vondracek (2012) only report small differences in vocational identity between males and females, whereas Elffers (2012) reports higher risks of dropout for males than for females. Dropout may in turn affect vocational identity negatively, as educational contexts create conditions for their students to learn about and to become aware of career interests and skills (Skorikov & Vondracek, 2012). A low parental educational level is understood to be a risk factor for vocational identity, since it may impede the ability to supply the level of support at-risk emerging adults need, such as an adequate room for homework and emotional support (van Zenderen, 2011). Fouad and Byars-Winston (2005) report that migrant minorities perceive more barriers to career success and fewer career opportunities. Further, Diemer and Blustein (2006) found a strong and flexible vocational identity to be especially beneficial for deprived and ethnic minorities. Favorable living conditions and positive family relationships may also affect vocational identity (Skorikov & Vondracek, 2012). Yet, peers are influential too and both family and peers appear more important for females than for males (Blustein, Palladino Schultheiss, & Flum, 2004). Fouad (2007) reports a relationship between socioeconomic status and vocational identity, whereas others found socioeconomic status not to be related to vocational identity (Skorikov & Vondracek, 2012).

The second cluster consists of personality characteristics which tend to stabilize during adolescence and early adulthood (Borghuis et al., 2017). As identity formation is largely determined by vocational identity, personality factors are assumed to explain differences in vocational identity (Skorikov & Vondracek, 2012). Studies have shown positive relationships between the personality traits extraversion, conscientiousness, and imagination and vocational identity. Especially neuroticism is found to be related to career exploration (Baay, Van Aken, Van der Lippe, & De Ridder, 2014; Fouad, 2007; Hirschi, 2012; Skorikov & Vondracek, 2012).

Aspects related to self-sufficiency factors form the third cluster and refer to factors that influence how at-risk emerging adults can manage aspects of their daily lives, and include, for example, finances, social support, and judicial experiences. Social support has shown to influence career exploration (Kracke, 1997). With respect to experiences in the judicial system, the number of arrests is a predictor of unemployment, but the negative effects of unemployment can be mediated by a strong vocational identity (Fouad, 2007; Meeus et al., 1997). The problematic circumstances and sociopolitical barriers endured by at-risk emerging adults limit their access to learning opportunities and may hinder vocational identity (Diemer & Blustein, 2006; van Zenderen, 2011).

The fourth cluster, referred to as self-competence, comprises the malleable characteristics motivation and resilience. Achievement motivation is supposed to contribute to goal orientation (Kappe, 2011; Kim, Schallert, & Kim, 2010), which is related to vocational future image and vocational self-efficacy (Lent, Brown, & Hackett, 2000). Intrinsic motivation is seen as less malleable than extrinsic motivation, and the latter can be encouraged by, for example, offering prospective salaries or other career outcomes.

Herrman et al. (2011) point to the contribution of resilience to work productivity as part of general well-being. Di Maggio, Ginevra, Nota, and Soresi (2016) define resilience as resistance, or a response to strain, in order to maintain equilibrium. Based on empirical studies, they report that resilience can be developed and is not innate. Several scholars stress the importance of resilience in the light of rapidly changing work demands (e.g. Blustein, 2013; Brahm et al., 2014; Heinrich & Holzer, 2011; Maree, 2017). Resilience includes personal and social competence, respectively reflecting independence and self-sufficient decision-making concerning main life issues, and the ability to build a social network and to appeal for support from others if necessary (Hjemdal, Friborg, Stiles, Rosenvinge, & Martinussen, 2006).

Finally, the fifth cluster consists of school engagement, which is presumed to be malleable (Fredricks, Blumenfeld, & Paris, 2004). Emotional school engagement refers to attitudes towards school and schooling. Elffers (2011) distinguishes two aspects of emotional school engagement: (1) sense of belonging—the extent to which students commit to being at school—and (2) valuing school outcome—the extent to which students value qualification. Skorikov and Vondracek (2012) report education to contribute significantly to vocational identity through the acquisition of work skills, students' awareness of their career interests and their possibilities to guide their own career. The influences of education on vocational identity are mainly promoted by integrating prospective working circumstances and conditions into the

curriculum, for instance through internships. Within the scope of curriculum-related characteristics, youths' engagement with school is related to persistence and success, that is, with continuing schooling until graduation.

In Figure 1, we present our conceptual model with the three constituent components of vocational identity (on the right) and the five clusters of individual characteristics (on the left). The distance of the arrows to the oval image represents characteristics' order of potential influence on vocational identity, that is, the shorter distance, the earlier it may have had an influence on vocational identity. Thickness of arrows represent malleability; the thicker the arrow, the more opportunities to modify the individual characteristics.

The above description makes clear that studies into the relationships between individual characteristics and vocational identity show a fragmented picture. Furthermore, a relatively small number of these studies is about at-risk emerging adults. The current study therefore has an exploratory character and addresses the following research question: "To what extent do individual characteristics related to demographics, personality, self-sufficiency, self-competence and school engagement explain differences in vocational self-image, vocational future image and vocational self-efficacy of at-risk emerging adults?"

Method

Research context

This exploratory cross-sectional study was carried out in the metropolitan area of Rotterdam, the Netherlands. Respondents were included based on (a) attendance at either one of two institutions offering education at the entry training level, the lowest level of senior secondary vocational education (see "Appendix 1"), (b) attendance at a rebound program for former dropouts to prepare them for re-entry vocational education, or (c) visiting the youth information desk, a municipal authority that guided
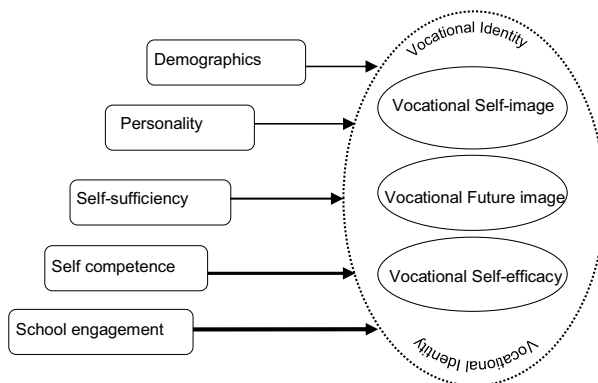

Figure 1 Conceptual model of the study

youths who were not employed, not in training or education, and that sent many of them to school or a rebound program.

We invited these institutions because they share in common to take care of vulnerable youths, of whom some were former dropouts and others were at risk of dropping-out. The attended entry level of secondary vocational education aimed at leading students to continuing education or to a job. Official governmental qualification to enter labor markets requires graduation at basic vocational training level, which is the next level. Some of the participants at these institutions will obtain a diploma and continue education at the basic level, others may have difficulty to graduate from the entry level.

Procedure and participants

Data collection took place at all eleven locations of four educational and community institutions, among which were the largest in the area. Three small-scale educational institutions, offering specialized study programs at the same educational level, were not included. Over a period of five months, a questionnaire was administered to the included target groups of emerging adults in classrooms and at the youth information desk. Participation was voluntary in all cases, leading to a sample of 996 respondents, consisting of 44% women and 56% men. Mean age of the total sample was 21.7 years, ranging from 15 to 27 years. Throughout this study we refer to our participants as emerging adults, based on Arnett's definition (2000), applying to (late) adolescents, emerging adults and adults, as these age groups were all represented in our sample.

Seventy percent of the respondents had a Dutch origin, and 25% reported a Dutch origin of their parents. Non-Dutch ethnicities included Surinamese and Caribbean origins, former colonies of the Netherlands (11% of respondents, 25% of parents). Fifty percent of the respondents reported a level of secondary education or higher of parents. One-third of the respondents did not know the educational level of their parents. The rest of the parents had only been educated at primary school level or had had no education at all. Ten percent of the respondents lived with their own child(ren), and 13% lived on their own. Concerning contact with police, 8% of the respondents reported actual contact and 42% previous contact. Fifty-eight percent of the respondents was not convicted; sentences concerned juvenile measure (13%), community penalty (21%), and detention (11%).

Measures

A questionnaire (see "Appendix 2") was designed based on existing scales (see next section), which were adapted in content and layout to cater for the language proficiency of the respondents. Professionals working with the respondents were involved in the design of the questionnaire and a draft was reviewed by them in order to optimize length, phrasing and degree of difficulty. An adjusted version was subsequently piloted with some at-risk emerging adults and discussed with them afterwards. Their answers, interpretations, and comments led to final adjustments. Their data were not

included in further analyses. In Table 1, we give an overview of all included variables with an example of items.

Apart from background information on sociodemographic data and experiences in the judicial system, all items were phrased to evoke respondents' own experiences or self-perceptions, preceded by subheadings like 'Who are you?' and 'How do you feel about school?'. Respondents answered on a five-point Likert scale from (*totally*) *No* to (*totally*) *Yes*; *totally* was printed in bold capitals. A score of 3 represented *no No, no Yes*. A question mark could be chosen if respondents could not answer or if they thought a question did not apply to them. The Likert scale accompanying the items on self-sufficiency consisted of five emoticons ranging from *very dissatisfied* to *very happy* as answering categories, to facilitate responding and to avoid misunderstandings. All items were coded with scores ranging from 1 to 5, with 3 as a neutral position, and higher scores reflecting more positive outcomes.

Vocational identity

Our main conceptual interest concerned relationships between individual characteristics and three components of vocational identity, which were inspired by three basic questions on working life: *Who am I*, *Who do I want to be*, and *Am I able to get there* (Fugate et al., 2004). The three questions were operationalized into vocational self-image, vocational future image and vocational self-efficacy, respectively reflecting the way at-risk emerging adults perceive their capabilities and talents, their aspirations, and their ability to perform at work. The operationalization of these three components of vocational identity was based on the Career and Talent Development Self-Efficacy Scale of Yuen, Gysbers, Chan, Lau, and Shea (2010). In order to adjust to the competences of respondents, additional sources were used for final items on vocational self-image (Jackson et al., 2011; Kuijpers, Meijers, & Gundy, 2011; Nauta, 2010), vocational future image, and vocational self-efficacy (Flouri & Buchanan, 2002; Nauta, Kahn, Angell, & Cantarelli, 2002; Restubog, Florentino, & Garcia, 2010). See "Appendix 2" for the complete questionnaire.

Five clusters of individual characteristics

The first cluster with demographic variables included age, gender, educational level of parents, and respondents' and parental ethnic backgrounds. Living conditions and whether the respondent followed the news indicated levels of independence and socio-economic status respectively. The second cluster consisted of personality variables for which we adapted the validated and translated items of the Mini-IPIP Scales (Denissen, Geenen, van Aken, Gosling, & Potter, 2008; Donnellan, Oswald, Baird, & Lucas, 2006). Adjustments were made to simplify wording without changing content.

The third cluster was formed by self-sufficiency variables indicating the level of satisfaction with different life circumstances and behavior. We rephrased items of the self-sufficiency matrix to act as an instrument for self-reporting (Fassaert et al., 2014) by asking to what extent respondents were satisfied with their own (control of) behavior (money, addiction), experiences (friends, judiciary), and circumstances

Table 1 Clusters with variables and example of item, and reliability of sums

Cluster	Variable	(Example of) item	N	Number of items in scale[a]	α	Range rit's
Demographic						
	Gender	Are you male or female?		1		
	Age	Date of birth		1		
	Education father	What kind of school did your father attend?		1		
	Ethnicity mother	What is the native country of your mother?		1		
	Living conditions	Who are you living with?		1		
	SES-following news	I watch the news on TV occasionally	914	4	.696	.348–.649
Personality						
	Extraversion	I talk to a lot of different people at parties	896	4	.616	.285–.470
	Agreeableness	I am kind to almost everyone	899	3 (1)	.677	.419–.530
	Conscientiousness	I persevere until a task is finished	921	4	.527	.230–.420
	Neuroticism	Sometimes I feel happy, sometimes I feel sad	937	2 (2)	.645	.476–.476
	Imagination	I come up with new ideas	909	4	.481	.246–.349
Self-sufficiency						
	Self-sufficiency	How satisfied are you about what you do during daytime?	926	7 (1)	.840	.429–.735
	Addiction	How satisfied are you about the way you deal with drugs?	913	5	.899	.593–.859
	Contact police	Have you ever been in contact with police or judiciary?		1		
	Contact at this time	Is there a case pending now?		1		
	Sentence	Have you ever been sentenced by juvenile guided correction?		1		
		Have you ever been sentenced by a community penalty?		1		
		Have you ever been sentenced by detention?		1		
		No sentence, but judicial measure		1		
		No sentence, no judicial measure		1		

Table 1 (continued)

Cluster	Variable	(Example of) item	N	Number of items in scale[a]	α	Range rit's
Self-competence						
	Extrinsic motivation	I do my best because others want me to	929	3 (1)	.681	.316–.601
	Intrinsic motivation	I do my best because I feel that's important	945	3 (1)	.774	.546–.650
	Personal resilience	I am sure I can well care for myself	832	10	.897	.502–.758
	Social resilience	I ask for help if I need to	882	8 (1)	.865	.505–.714
School engagement						
	Sense of belonging	I prefer being somewhere other than at school (R)	894	5 (1)	.812	.498–.744
	Valuing	I'm sure that I will finish a training	891	5	.876	.657–.774
Dependent						
	Vocational self-image	I know what I'm good at	874	7 (1)	.818	.196–.702
	Vocational future image	I want to discover what kind of work I can do	897	3 (1)	.642	.399–.517
	Vocational self-efficacy	Later on, at my job, I'll stick to the rules	893	7	.922	.538–.839

α Cronbach's α. Range rit's = item rest correlation

[a] In parenthesis number of items per scale removed according to CFA

(housing). From the original scale we used items on finance, daily activities, living conditions, family relationships, physical health, mental health, social network, societal participation, addiction, and contacts with police and experiences with judiciary.

Variables related to self-competence formed the fourth cluster. For these items we built on work on personal and social resilience (Brahm et al., 2014; Heinrich & Holzer, 2011; Ryan & Deci, 2000; Ungar et al., 2008) and, in particular, on items on personal competence and social resources, stemming from the Resilience Scale for Adolescents (READ), developed and psychometrically tested in several studies (e.g. Hjemdal, Friborg, Stiles, Martinussen, & Rosenvinge, 2006; von Soest, Mossige, Stefansen, & Hjemdal, 2009; Windle, Bennett, & Noyes, 2011). Items on intrinsic and extrinsic motivation stemmed from the Learning Self-Regulation Questionnaire SRQ-L (Ryan & Connell, 1989), using the items on pride and importance, and remained unchanged.

Finally, the fifth cluster was formed by two variables on school engagement: sense of belonging at school, and valuing the intended outcome of school attendance. We based the items on studies of Elffers (2012) and of Elffers, Oort, and Karsten (2012). Some of these items were not applicable, as they suggested that students had a choice in which program to participate. For some of the participants in our study, the attended program offered a last chance to complete school.

Analyses

Validity

The validity of the seventeen constructs that each were measured by several items was verified by confirmatory factor analyses (CFA), using version 7 of the Mplus program (Muthén & Muthén, 1998–2015). Because variables were categorical, we used as an estimation procedure Weighted Least Squares with Means and Variances (WLSMV). Seventeen latent traits were included in the model; the remaining six constructs were measured by only one item and were therefore not included in the CFA.

Model fit was evaluated by means of goodness-of-fit indices: the Chi square statistic (χ^2), the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker Lewis Index (TLI). The χ^2 statistic tests exact fit, which is a very strict criterion for the social sciences (MacCallum, Browne, & Sugawara, 1996). Moreover, χ^2 is highly sensitive to sample size. The additional fit indices compensate for these restrictions. RMSEA values below .05 are considered indicative of close fit, values between .05 and .08 indicate fair fit, values between .08 and .10 indicate mediocre fit and values above .10 indicate poor fit (Hu & Bentler, 1999; MacCallum et al., 1996). In addition, a model fit is considered acceptable when CFI and TLI are larger than .90 and good when above .95 (Bentler, 1992; Hu & Bentler, 1999).

The first model showed close fit according to RMSEA but had insufficient values for CFI and TLI. We therefore used modification indices and standardized residuals to trace the items that caused misfit. In reviewing the content of these items,

decisions to remove items were made on both empirical and theoretical grounds. In subsequent steps, CFAs were performed again with adjusted models, resulting in the fourth model with $N=996$; $\chi^2=9328.021$, $df=3266$, $p<.000$; RMSEA $=.043$ with a 90% confidence interval of .042-.044 (close fit); and CFI $=.909$, TLI $=.903$ (both acceptable). Out of the 104 original items, in this close-fitting model ten items of nine variables were removed (see Table 1). All remaining items showed significant loadings on the construct they were intended to measure.

Reliability

Sums were made for each of the seventeen variables, using only items remaining in the close-fitting model. As model fit in Mplus does not guarantee an acceptable level of reliability of sums, reliability of the sums was estimated by means of Cronbach's alpha. Alphas need to be at least .60 for research at group level (Bryman, 2012). The scales of conscientiousness and imagination showed slightly lower levels, which should be kept in mind when interpreting the results. All other alphas varied between .616 and .922 indicating good to high reliability (see Table 1).

Regression analyses

To estimate effects of variables on the three components of vocational identity, we used regression analyses in two steps. First, regression analyses were conducted to estimate the main effects of individual characteristics to at least one of the vocational identity components. See "Appendix 3" for regression coefficients. Only variables that showed a significant univariate relationship with a dependent variable are presented.

Second, individual characteristics showing significant relationships were then selected for multivariate regression analyses with blockwise entry to investigate the extent to which the first cluster of variables contributed to the proportion of explained variance, and, subsequently, the extent to which each following cluster of variables contributed to a change in the proportion of explained variance for each of the three vocational identity components while controlling for the contribution of variables of former clusters. As we look for malleable characteristics that can be encouraged by curricula, that is, for self-competence and school engagement characteristics, we need to avoid attributing relationships to characteristics while they in fact should be attributed to other characteristics. For this reason, variables were placed in sequential clusters of hypothesized influence, and the analysis was performed accordingly. Following the sequence of Figure 1, the analyses started with demographic factors, continued with, respectively, personality and self-sufficiency, and ended with self-competence and school engagement variables. By controlling for the effects of covariates, false inferences were minimized, enabling justified conclusions about the most malleable factors. Since the CFA model does not include variables with only one indicator, e.g. age and ethnicity, to obtain a full overview, correlations of these variables with each of the three dependent variables were computed (see last three columns in "Appendix 3").

As eleven locations of four institutions were involved in our study, we checked for the need for multilevel regression analyses by verifying whether adding a variance level to the random part of the regression model significantly improved model fit. For vocational self-image, a significant proportion of .025 location level variance was found; however, after adding predictors, the multilevel structure disappeared and no further multilevel analysis was needed. The other two dependent variables showed no significant intra-class correlation for institutes or locations. Further, we also checked for correlated error with the Durbin-Watson test; values lower than 1 and larger than 3 indicate that residuals are correlated too much.

We therefore performed regression analyses, starting with demographic variables, to explain the proportion of variance of this cluster in the three vocational identity components (R^2-change). Non-significant variables were removed stepwise: The variable with the highest p value was omitted first. Then the analysis was repeated, until only significant predictors of the cluster remained. In the first model, 1a (see Appendices 4, 5, and 6 for the three vocational identity components respectively), results of the first regression analysis of the demographic cluster of variables were reported. Then the contribution of the personality variables cluster was analyzed while controlling for the effect of the demographic variables. Non-significant predictors were again removed, thus starting with the variable with the highest p-value, and continuing until only significant predictors remained, resulting in the personality variables which accounted for a change in the proportion of explained variance. Model 2b (see Appendices 4, 5, and 6) shows the results of the second cluster. Next the change in proportion of variance explained by the third cluster, the self-sufficiency variables, was computed, controlling for the effects of the first and second clusters of variables. The same procedure was followed for the clusters of self-competence and school engagement, finally resulting in a model with those variables that sufficed to explain the variance, and potentially showing any change in proportion of explained variance caused by malleable variables.

Results

The components of vocational identity were measured on a five-point Likert scale with 3 as a neutral position. The means were 4.05 for vocational self-image, 3.54 for vocational future image, and 4.51 for vocational self-efficacy. The at-risk emerging adults in our study evaluated their capabilities and their prospective work behaviors as quite positive.

Final models of the blockwise entry analyses for each vocational identity component are presented in Appendices 4 (Vocational self-image), 5 (Vocational future image), and 6 (Vocational self-efficacy). Please note that only final models of each cluster are reported. Neither the reference models (models 2a, 3a, 4a, and 5a), nor intermediate models are included in the tables. An overview of the percentages of explained variance by cluster for each component of vocational identity, after correction for preceding clusters, is shown in Table 2, with an enumeration of the significant variables. Most attention is drawn to the variables from the self-competence and school engagement clusters, as our search is directed to the additional proportion

Table 2 Percentages of explained variance for vocational self-image, vocational future image, and vocational self-efficacy, after correction for preceding clusters

Cluster of variables	Vocational self-image (see App. 4)	Vocational future image (see App. 5)	Vocational self-efficacy (see App. 6)
Demographics	3.6 Gender	3.9 Dutch mother Living caregiver Living child	6.7 Gender
Personality	18.8 Agreeableness Conscientiousness Imagination	6.2 Imagination	21.8 Agreeableness Conscientiousness
Self-sufficiency	3.1 Self-sufficiency	1.0 Self-sufficiency	n.s.
Self-competence	12.2 Intrinsic motivation Personal resilience Social resilience	3.3 Extrinsic motivation Social resilience	10.6 Intrinsic motivation Personal resilience
School engagement	n.s.	1.3 Valuing	.8 Valuing
Total percentage of explained variance	40.3%	13.1%	39.4%

of explained variance of malleable and applicable characteristics. Durbin-Watson values did not indicate too much correlated error (all were between 1 and 3).

Vocational self-image

Results for vocational self-image reflect the *Who am I?* question, addressing self-perceptions of at-risk emerging adults on their vocational capabilities. "Appendix 4" shows results of additional proportions of variance (R^2-change) in vocational self-image explained by the five clusters of predictors. The demographic variables explained 3.6% of variance in vocational self-image, which should be ascribed to females as they showed higher levels of vocational self-image than males, and to the degree to which respondents follow the news, as following more news coincided with a lower level of vocational self-image. These results for gender and socio-economic status disappeared, however, after subsequent clusters of variables were added to the model. Agreeableness, conscientiousness, imagination and neuroticism explained an additional 18.8% of variance in vocational self-image. Self-sufficiency contributed significantly to the prediction of vocational self-image after correcting for the former clusters with 3.1% of additional explained variance, but its effect was no longer significant when variables of the cluster self-competence were added in a subsequent model. The cluster of self-competence variables contributed significantly and substantially to the explained variance in vocational self-image (12.2%). This can be seen by the beta coefficients confirming the most prominent positions

for personal and social resilience (see last column in "Appendix 4"). Finally, the additional variance explained by school engagement, the most malleable factor, was not significant for vocational self-image after correcting for previous clusters.

In sum, the variables that contributed most to the prediction of the final model of vocational self-image were personal and social resilience, followed by intrinsic motivation, agreeableness, conscientiousness, and imagination. The total percentage of variance in vocational self-image explained by all individual characteristics was 40.3%.

Vocational future image

Vocational aspirations and ambitions of at-risk emerging adults, put into the *Who do I want to be*? question, are represented in the variable vocational future image (see "Appendix 5" for results). Demographic variables explained a significant proportion of variance (3.9%), with positive effects of living with father and caregiver, but with a negative effect of living with a child, which is interpreted as a consequence of necessary time and attention for a child instead of efforts put into school or homework. After correcting for the demographic variables, the personality variables explained a relatively large percentage of variance, 6.2%, in vocational future image, exclusively accounted for by imagination. Self-sufficiency, and more specifically addiction, added significantly but modestly to the explained variance in vocational future image (1.0%), but the effect disappeared after adding the school engagement constructs. The cluster of self-competence explained an additional 3.3% of the variance of vocational future image, which was ascribed to extrinsic motivation and social resilience. Additionally, beta coefficients showed that the contribution to the total variance explained by self-competence variables should mainly be attributed to extrinsic motivation. In contrast with vocational self-image, one of the two school engagement variables did add significantly to the explained variance in vocational future image, namely valuing (1.3%; see model 5c, "Appendix 5").

Summarizing findings on vocational future image, the total percentage of explained variance was 13.1%. The variables that contributed most to the prediction of vocational future image were imagination, extrinsic motivation, valuing and social resilience, as did having a Dutch mother and living with a child, these last two coinciding with a lower level of vocational future image.

Vocational self-efficacy

Vocational self-efficacy beliefs of at-risk emerging adults on their work habits and values reflect the *Am I able to get there*? question. "Appendix 6" shows results of analyses of clusters of variables which contributed most to the percentage of explained variance in vocational self-efficacy. The demographic variables accounted for 6.7% of explained variance in vocational self-efficacy, predicted by gender and socio-economic status. Females showed higher levels of vocational self-efficacy than males, and respondents who follow the news compared to those who don't, showed a lower level of vocational self-efficacy. The results thus resembled those

in vocational self-image, yet, the significance of gender did not disappear in subsequent models. The cluster of the personality variables significantly explained 21.8% of the variance in vocational self-efficacy, with important contributions of agreeableness and conscientiousness. After correction for demographic and personality variables, self-sufficiency variables did not explain a significant extra percentage of variance. The cluster of self-competence variables contributed significantly to the prediction of vocational self-efficacy after correction for the former clusters with 10.6% of additional explained variance. Standardized beta coefficients show that the main contribution could be attributed to personal resilience and intrinsic motivation. Finally, from the cluster of school engagement, valuing accounts for an additional .8% of explained variance in vocational self-efficacy after correcting for all variables in the former clusters (model 5b).

Summarizing the results concerning vocational self-efficacy, the total percentage of explained variance was 39.4%. The variables in the final model that contributed most to the prediction of vocational self-efficacy were personal resilience and intrinsic motivation, followed by valuing, agreeableness and conscientiousness.

Discussion and conclusion

Differences in vocational self-image, vocational future image, and vocational self-efficacy of at-risk emerging adults were explained by a series of individual characteristics. The individual characteristics were grouped in demographics, personality traits, self-sufficiency, self-competence, and school engagement. The self-competence characteristics consisted of intrinsic and extrinsic motivation and personal and social resilience. The school engagement characteristics concerned sense of belonging at school and valuing school outcome. Self-competence and school engagement are the variables that can be influenced by school programs. Due to the conceptualization of vocational identity into three components, our findings cannot in all cases be directly connected to those of previous studies and at times interpretations were made from a more general perspective.

Three main findings were shown. First, the cluster of personality traits explained the highest proportions of variance, mainly due to agreeableness, conscientiousness, and imagination. Second, self-competence and school engagement contributed additionally to the proportion of explained variance of vocational identity after correcting for former clusters of characteristics. These specifically concerned extrinsic and intrinsic motivation, personal and social resilience, and valuing school outcome. Third, characteristics that contributed to the proportion of explained variance of vocational self-image and vocational self-efficacy differed from those contributing to vocational future image.

With respect to the personality traits, our findings partly coincided with findings of former studies. Extraversion did not contribute to any of the vocational identity components in the final models, but agreeableness and conscientiousness did contribute considerably to vocational self-image and vocational self-efficacy. Whereas the relationship between conscientiousness and vocational identity was reported previously (e.g. Fouad, 2007; Skorikov & Vondracek, 2012), the result

for agreeableness with respect to vocational self-image and vocational self-efficacy adds to literature. In contrast to what could have been assumed based on a study of Hirschi (2012), neuroticism did not contribute to vocational future image. In the current study we found that imagination was most strongly related to vocational future image and, moreover, that imagination was the only personality trait that contributed to this component of vocational identity. This result underlined the importance of open-mindedness for explorative behavior.

With respect to the second main finding, Table 3 presents an overview of the three characteristics from the self-competence and school engagement clusters showing the highest proportion of explained variance for each of the three vocational identity components (in terms of beta-coefficients, see last column in Appendices 4, 5 and 6). Because of their malleable nature, these characteristics offer promising opportunities to foster vocational identity. These insights add to literature and enable refined approaches to the at-risk emerging adults.

These findings were generally in line with the findings of former studies, which also showed the relationships between motivation, resilience, or engaging at school and vocational identity (e.g., Blustein, 2013; Skorikov & Vondracek, 2012). However, no additional proportion of variance was explained by the sense of belonging at school of our participants. General attitudes towards schooling showed no connection to self-perceived capabilities, ambitions and anticipated behaviors at work. This finding suggests that for the at-risk emerging adults in our study the sense of belonging at school represents a dimension that has mainly to do with present school life and less so with future careers. The other malleable characteristics all contributed to the final models.

Regarding motivation, results revealed that extrinsic motivation only related to vocational future image. This exclusive contribution of extrinsic motivation to vocational future image is interpreted as the at-risk emerging adults' valuing of expected rewards and their sensitivity for status, corresponding to former findings (Chaves et al., 2004; van Zenderen, 2011). Ambitions may extend beyond capabilities, and acknowledging limits and performances may force to more realism. The drive for external rewards was absent for vocational self-image and vocational self-efficacy, but intrinsic motivation showed to relate to these components of vocational identity. Self-perceived job capabilities, that is, knowing what you are good at, and expected performances at work, that is, appropriate work behavior, stem from internally-driven perspectives. These refinements between the contribution of extrinsic motivation on vocational future image on the one the hand and of intrinsic motivation on vocational self-image and vocational self-efficacy on the other hand could not be recognized in former studies.

Table 3 Contribution of variables of the clusters self-competence and school engagement to proportions of explained variance in the three parts of vocational identity, based on the magnitude of standardized regression coefficients

Main Contributions	Vocational self-image	Vocational future image	Vocational self-efficacy
1	Personal resilience	Extrinsic motivation	Personal resilience
2	Social resilience	Valuing	Intrinsic motivation
3	Intrinsic motivation	Social resilience	Valuing

Resilience contributed to all three components of vocational identity. Social resilience did so with regard to vocational self-image and vocational future image, which can be explained by the contribution of social support to adaptable and explorative nature (Kracke, 1997; Maree, 2017). Personal resilience contributed to vocational self-image and vocational self-efficacy. These findings on at-risk emerging adults align with the findings from studies about other target groups (e.g. Brahm et al., 2014; Chaves et al., 2004), but the refinements of our findings add to literature. Students' resilience is understood to be a characteristic that can be fostered by educational or rebound programs (Di Maggio et al., 2016).

Finally, the significant contribution of valuing school outcome to vocational future image and vocational self-efficacy expressed its connection to work exploration and prospective work behaviors. Apparently, insights of at-risk emerging adults into their own talents and capabilities, or their vocational self-image, were independent of their wish to graduate, in contrast to aspirations and anticipated performances for which this graduation forms a necessary prerequisite.

The third main finding related to different relationships of the three components of vocational identity. A first difference referred to the total proportion of explained variance, which was some 40% for both vocational self-image and vocational self-efficacy, whereas the included individual characteristics only explained 13% variance in vocational future image. Further, some distinctions were noticed in which characteristics contribute to the results. Imagination was the most important characteristic in vocational future image, but played a smaller role in vocational self-image, and is absent in the model of vocational self-efficacy. The reverse was seen in the result of extrinsic motivation. For at-risk emerging adults imaging your future (vocational future image) was strongly related to expected rewards (extrinsic motivation), in a material or immaterial sense. This motivation is fed by ideas about an imaginative future, which may lead to further expectations about rewards. Both extrinsic motivation and imagination coincide and reinforce each other. In this sense, imagination expresses the challenge emerging adults experience when trying to set realistic future goals (Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002), which complicates the process of settling a vocational identity. Valuing imagination should then be faced with caution. At the same time, however, imagination as expression of open-mindedness, is known to be helpful in career exploration (Fouad, 2007; Skorikov & Vondracek, 2012). A teaching approach which focuses on stimulating the open-mindedness of at-risk emerging adults, does have the potential to encourage a strong vocational identity. Thus, imagination can be both an obstructing and a helpful component in vocational identity: It prevents students from forming realistic future goals, but it might also be necessary to allow them to have dreams and remain motivated.

Some final results are discussed. In contrast to former studies, the at-risk emerging adults with Dutch parents showed negative relationships with vocational identity (van Zenderen, 2011). An explanation might be that migrant parents put stronger emphasis on the careers of their offspring, based on their own experiences with barriers and in an attempt to contribute to better perspectives for them. Partly in line with results from Fouad's review (2007), experiences in the judicial system related to vocational identity, but only with respect to vocational self-efficacy, and for the

at-risk emerging adults in our study these effects disappeared after the self-competence and school engagement clusters were taken into account.

Practical implications

Findings of the current study provide educational and social professionals input to strengthen their students' vocational identities by making use of the motivational and resilience characteristics and by integrating modifications to improve vocational identity into their programs. They support their students to define and work on their own goals, in order to stimulate feelings of intrinsic motivation and enable their students to experience self-rewarding benefits. Additionally, professionals can use personality variables to carefully adapt their approaches to characteristics of the target (sub)groups. During internships, fostering agreeable, conscientious, and imaginative acting through design of assignments is recommended. In order to apply these strategies, professionals need to know the nature and level of motivation and of resilience of the emerging adults they guide, and have insights into their personality traits, especially imagination and conscientiousness.

The combination of valuing and extrinsic motivation, both fostering the development of at-risk emerging adults' vocational identities, also deserves consideration here. These emerging adults are willing to persevere to obtain a school certificate in return for expected rewards. Considering the extrinsic motivation and open-mindedness of at-risk emerging adults, professionals should stress the value of obtaining a qualification, and simultaneously lead emerging adults' future ideas and perspectives toward achievable goals.

Finally, the importance of personal and social resilience creates opportunities for teachers, mentors and coaches to adapt the design of their programs and the guidance they offer to their students. Professionals who challenge emerging adults' decision-making proficiency, provide them the opportunity to gradually rely on their own competences. Emerging adults can also best be encouraged to ask for help and support from others. Through strategies like these, both personal and social aspects contribute to boosting resilience levels and thus indirectly to an improved vocational identity.

Limitations

Participants in our study were referred to as emerging adults. This term is not completely accurate, as respondents were aged in between fifteen and twenty-seven years and thus also included (late) adolescents and adults. However, no indications were detected that results did not apply for all included age groups. Results are relevant to at-risk emerging adults struggling with diverse obstacles, during a schooling period and the transition period between school and work.

For this study a questionnaire was based on existing validated scales and items. Adjustments were limited to rephrasing in order to align with the vocabulary and comprehension of our target groups of at-risk emerging adults, of whom many

attended a school at the lowest level of senior secondary vocational education or a preparatory rebound program. Analyzing the validity of our model showed a satisfactory result. A full psychometric evaluation has not been done yet, and this would add to the value of our instrument.

Directions for future research

This study confirms the complexity of vocational identity among at-risk emerging adults. It shows that its three components each has its own specific value for the fostering of at-risk emerging adults' overall vocational identity. This multifaceted perspective establishes a wide range of new research questions, such as the interconnectedness of the three components of vocational identity, the differences between malleable characteristics and characteristics which can enable subgroup composition, and the potential different sequences with which the three components are best encouraged.

To address the latter question, fostering idealistic visions about the working future can act as a prerequisite for gaining realistic ideas about a future career and a person's role and performance in it, emphasizing the merits of imagination. Generating ideas about a vocational future image then helps at-risk emerging adults to acquire a clear picture of their vocational self-image and vocational self-efficacy. This reasoning could be turned around, and as a consequence, actual capabilities and expected performing abilities direct, or even limit, the future potential. Both approaches are conceivable and may be equally valuable. Longitudinal research is needed to shed light on the respective contributions and the interrelationships of the three vocational components to the vocational identity of at-risk emerging adults, and the balance of realism versus idealism that accompanies these questions.
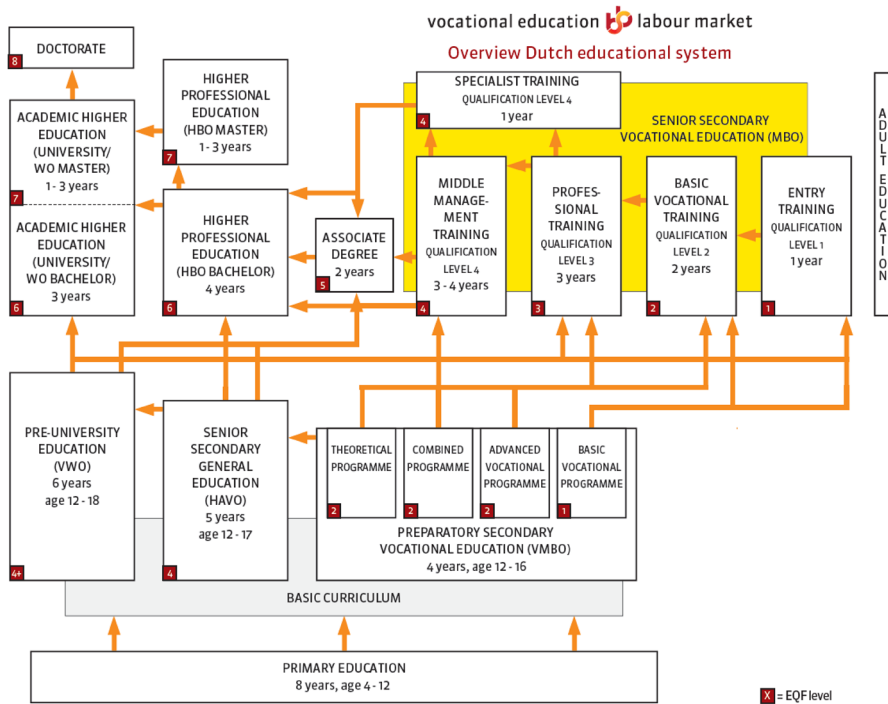
Concluding remarks

Five clusters of individual characteristics in a hierarchy of malleability are related to the vocational identity of at-risk emerging adults. Most malleable characteristics contribute significantly to the three components of vocational identity, enabling professionals who guide this target group to adjust their approach and program content. More specifically, based on the results from this study, addressing extrinsic and intrinsic motivation, personal and social resilience and valuing school outcome opens a spectrum of possibilities to professionals to further vocational identity and thus strengthen the social position of at-risk emerging adults.

Appendix 1

Overview Dutch educational system

Retrieved from https://www.s-bb.nl/education/dutch-educational-system

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Appendix 2

Questionnaire of the study on vocational identity among at-risk emerging adults

This questionnaire has been administered in The Netherlands. Items are translated from Dutch into English for the purpose of this article.

Demographic background and personal characteristics
Age
Gender
Living conditions

Who are you living with

Ethnicity self/father/mother

What is the native country of you/your father/your mother

Education father/mother

What kind of school did your father/your mother attend

SES-following news
I read about Dutch news in newspapers occasionally
I read about foreign news in newspapers occasionally
I watch the news at TV occasionally
I listen to news on the radio occasionally

Police
Have you ever been in contact with police or judiciary
Is there a case pending now

Judiciary
Have you ever been sentenced

Scales and items

Extraversion
People feel cheered up by me
I am talkative
I talk to a lot of different people at parties
I am quiet (R)

Agreeableness
I like to help others
I sympathize with others' feelings
I am kind to almost everyone

Conscientiousness
I am easily distracted (R)
I persevere until a task is finished
I like to be organized
I stick to agreements

Neuroticism
Sometimes I feel happy, sometimes I feel sad
I feel blue sometimes

Imagination
I have an active imagination
I come up with new ideas
I am curious
I am inventive

Self-sufficiency

How satisfied are you about

… your money

… what you do during daytime

… your housing facilities

… how things are at home

… how healthy you are

… how you feel

… your friends

Addiction

How satisfied are you about the way you deal with

… smoking

… alcohol

… drugs

… gambling

… gaming

Intrinsic motivation

I do my best because

… I enjoy that

… I feel that is important

… it makes me feel proud

Extrinsic motivation

I do my best

… because others want me to

… so others will like me

… because I'll get in trouble if I don't

Personal Resilience

I create my own life

I am sure what to do to solve my problems

I am sure I

… can handle my problems myself

… come up with solutions for my problems

… can well care for myself

… can take important decisions about my life

… can take important decisions about learning

… can take important decisions about my work

… can take important decisions about housing

… can take important decisions about my money

Social resilience

I have a good friend

I have someone to talk to if there's trouble

Someone is really there for me if I need so
I ask for help if I need to
I know whom I can ask for help
I can depend on my family
I can depend on my friends
My family helps me

Sense of Belonging at school

School is okay for me
I like going to school
I think it is important to go to school
I prefer being somewhere other than at school (R)
I prefer going to school over working

Valuing school outcome

I really wish to graduate
A degree is important to find a job
I'm sure that I will finish a training
I feel up like a training
I think I would really learn a lot during a training

Vocational Self-Image

I really wish to know what I'm good at
I know my strengths
I know my weak points
I know what I'm good at
I know what I'm not good at
I know what I can handle
I know my limits

Vocational Future Image

I keep coming up with new ideas about work
I am really looking for what I think is important in work
I want to discover what kind of work I can do

Vocational Self-Efficacy

Later on at my job
… I'll be on time
… I'll work independently
… I'll do a good job
… I'll finish my work in time
… I'll use my time effectively
… I'll stick to the rules
… I'll stick to agreements

Appendix 3

Relatedness of individual characteristics to vocational self-image, vocational future image and vocational self-efficacy; in regression coefficients (SE) and in correlations

Individual characteristic	Regression coefficients			Correlations		
	Vocational self-image[a]	Vocational future image	Vocational self-efficacy	Vocational self-image	Vocational future image	Vocational self-efficacy
Gender[b] (M=0, F=1)	.111** (.041)		.212*** (.037)	.096**		.193**
Age[b]	.019* (.008)		.013* (.006)			.080*
Education mother[b]					−.126**	
Ethnicity father Dutch[b]	−.106* (.044)	.141* (.064)	−.084* (.042)	−.084*	−.077*	−.069*
Ethnicity mother Dutch[b]	−.103* (.044)	−.196** (.061)	−.100* (.041)	−.085*	−.110**	−.083*
Living with father[b]		.156** (.059)			.088**	
Living with caregiver[b]		.557** (.178)			.104**	
Living with sister[b]		.146* (.063)			.077*	
Living with child[b]	.160* (.067)	−.213* (.089)	.170** (.061)	.088**	−.080*	.092**
SES-Following news[b]	−.310*** (.063)		−.242*** (.058)	−.149**		−.143***
Extraversion	.129*** (.028)	.082* (.039)	.081** (.026)	.386***	.232***	.325***
Agreeableness	.366*** (.031)	.186*** (.045)	.388*** (.027)	.536***	.329***	.623***
Conscientiousness	.372*** (.032)		.389*** (.029)	.607***	.290***	.734***
Neuroticism	−.041* (.019)	.055* (.026)		−.127**		
Imagination	.221*** (.031)	.257*** (.042)	.177*** (.029)	.519***	.365***	.403***
Self-sufficiency	.164*** (.029)			.277***	.128**	.132**
Addiction		−.069** (.026)	.040* (.017)		−.118***	.150***
Contact with police[b]			.155*** (.038)			−.137***

Individual characteristic	Regression coefficients			Correlations		
	Vocational self-image[a]	Vocational future image	Vocational self-efficacy	Vocational self-image	Vocational future image	Vocational self-efficacy
Juvenile measure[b]			-.110* (.045)			-.066*
Community penalty[b]						-.081*
Detention[b]			-.205*** (.061)			-.112***
Judicial measure[b]			-.236** (.074)			-.106**
No sentence no measure[b]			.114** (.038)			.100**
Extrinsic motivation		.154*** (.028)			.210***	
Intrinsic motivation	.384*** (.027)	.115** (.041)	.391*** (.024)	.579***	.291***	.645***
Personal Resilience	.568*** (.030)	.205*** (.048)	.477*** (.029)	.623***	.252***	.626***
Social Resilience	.319*** (.026)	.168*** (.038)	.208*** (.025)	.479***	.225***	.403***
Sense of belonging	.131*** (.025)	.087*** (.034)	.139*** (.022)	.283***	.227***	.334***
Valuing of school	.289*** (.029)	.224*** (.039)	.290*** (.025)	.439***	.342***	.495***

[a]For vocational self-image main effects per characteristic were analyzed multilevel, since location level showed significant variance. As in subsequent analyses with clusters of variables the ML structure for vocational self-image disappeared due to more missings, all further analyses were conducted unilevel

[b]Variables showing correlations between observed scores (pmcc, standardized). Correlations between observed scores are attenuated by measurement error, and therefore have lower levels than those stemming from the structural equation model. All other variables measured by Likert scales with correlations according to CFA

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

Appendix 4

Effects of clusters of variables on vocational self-image, in regression coefficients (SE) and in beta-coefficients for final model

Cluster	Variables	Model 1a	Model 2b	Model 3b	Model 4b	Model 5b	Beta[a] Model 5b
	Intercept	4.150 (.157)	1.924 (.209)	1.289 (.210)	.627(.184)	.550 (.189)	
Demographic	Gender (M=0, F=1)	.104* (.044)	.038 (.043)				
	Age	−.007 (.006)					
	Ethnicity father Dutch	−.062 (.064)					
	Ethnicity mother Dutch	−.069 (.062)	−.054 (.043)				
	Living with child	.103 (.073)					
	SES-following news	−.240*** (.065)	−.033 (.062)				
Personality	Extraversion		.035 (.031)				
	Agreeableness		.198*** (.038)	.204*** (.035)	.143*** (.035)	.133*** (.035)	.141
	Conscientiousness		.232*** (.038)	.250*** (.035)	.090* (.036)	.113** (.036)	.119
	Neuroticism		−.051** (.020)	.000 (.020)			
	Imagination		.114** (.036)	.116*** (.031)	.062* (.030)	.063* (.030)	.071
Self-sufficiency	Self-sufficiency			.143*** (.027)	.021 (.028)		
Self-competence	Intrinsic motivation				.111** (.034)	.114*** (.035)	.133
	Personal resilience				.326*** (.039)	.305*** (.038)	.312
	Social resilience				.094** (.030)	.111*** (.028)	.145
School engagement	Sense of belonging					−.043 (.026)	−.064
	Valuing					.058 (.032)	.074
	F (df1; df2)	4.563 (6, 738)	21.142 (8, 640)	44.178 (5, 711)	55.806 (7, 607)	48.988 (8, 580)	
	p	.000	.000	.000	.000	.000	

Cluster	Variables	Model 1a	Model 2b	Model 3b	Model 4b	Model 5b	Beta[a] Model 5b
	Durbin–Watson	2.030	2.009	2.018	2.031	2.041	
	N	745	649	717	615	589	
	R^2	.036	.209	.237	.392	.403	
	Adj. R^2	.028	.199	.232	.385	.395	
	R^2-change		.188	.031	.122	.004	
	F-change ($df1$; $df2$)		30.372 (5, 640)	28.546 (1, 711)	40.516 (3, 607)	2.024 (2, 580)	
	p F-change		.000	.000	.000	.133	

[a]Standardized regression coefficients

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

Appendix 5

Effects of clusters of variables on vocational future image, in regression coefficients (SE) and in beta-coefficients for final model

Cluster	Variables	Model 1a	Model 2b	Model 3b	Model 4b	Model 5c	Beta[a] Model 5c
	Intercept	3.553 (.042)	2.154 (.239)	2.469 (.238)	1.557 (.322)	1.543 (.251)	
Demographic	Ethnicity father Dutch	−.025 (.086)					
	Ethnicity mother Dutch	−.171* (.083)	−.243*** (.062)	−.182** (.061)	−.161* (.067)	−.243*** (.062)	−.143
	Living with father	.124* (.063)	.158* (.063)	.141* (.062)	.114 (.067)		
	Living with caregiver	.577*** (.175)	.580** (.185)	.568** (.197)	.524* (.208)	.401* (.180)	.080
	Living with sister	.061 (.067)					
	Living with child	−.194* (.091)	−.243* (.095)	−.277** (.097)	−.328** (.103)	−.324*** (.097)	−.120
Personality	Extraversion		.013 (.043)				
	Agreeableness		.074 (.051)	.106* (.049)	.076 (.058)		
	Neuroticism		.050 (.027)				
	Imagination		.252*** (.050)	.263*** (.047)	.184*** (.052)	.217*** (.045)	.176
Self-sufficiency	Addiction			−.074** (.026)	−.062* (.028)		
Self-competence	Extrinsic motivation				.119*** (.034)	.124*** (.031)	.146
	Intrinsic motivation				.043 (.054)		
	Personal resilience				.114 (.061)		
	Social resilience				.070 (.046)	.094* (.040)	.090

Cluster	Variables	Model 1a	Model 2b	Model 3b	Model 4b	Model 5c	Beta[a] Model 5c
School engagement	Sense of belonging						
	Valuing					.130** (.041)	.119
	F ($df1$; $df2$)	5.525 (6, 820)	10.466 (8, 706)	12.114 (7, 720)	8.715 (11, 598)	14.717 (7, 686)	
	p	.000	.000	.000	.000	.000	
	Durbin–Watson	1.992	1.880	2.048	1.952	1.949	
	N	827	715	728	610	694	
	R^2	.039	.106	.105	.138	.131	
	Adj. R^2	.032	.096	.097	.122	.122	
	R^2-change		.062	.010	.033	.013	
	F-change ($df1$; $df2$)	12.185 (4, 706)		7.918 (1, 720)	5.695 (4, 598)	9.997 (1, 686)	
	p F-change	.000	.000	.005	.000	.002	

[a]Standardized regression coefficients

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

Appendix 6

Effects of clusters of variables on vocational self-efficacy, in regression coefficients (SE) and in beta-coefficients for final model

Cluster	Variables	Model 1a	Model 2b	Model 3b	Model 4b	Model 5b	Beta[a] Model 5b
	Intercept	4.193 (.146)	2.278 (.170)	2.222 (.168)	1.421 (.162)	1.292 (.166)	
Demographic	Gender (M=0, F=1)	.199*** (.040)	.113** (.035)	.110** (.035)	.116*** (.034)	.127*** (.034)	.120
	Age	.006 (.006)					
	Ethnicity father Dutch	−.043 (.059)					
	Ethnicity mother Dutch	−.077 (.057)	−.040 (.037)				
	Living with child	.075 (.066)					
	SES-following news	−.236*** (.060)	−.073 (.053)				
Personality	Extraversion		.009 (.026)				
	Agreeableness		.215*** (.033)	.256*** (.030)	.159*** (.031)	.163*** (.031)	.185
	Conscientiousness		.279*** (.031)	.277*** (.031)	.151*** (.033)	.158*** (.032)	.178
	Imagination		.032 (.031)				
Self-sufficiency	Addiction			.015 (.016)			
	Contact police			−.048 (.049)			
	Community penalty			.027 (.057)			
	Detention			−.025 (.063)			
	Judicial measure			−.094 (.079)			
	No sentence			−.073 (.058)			

Cluster	Variables	Model 1a	Model 2b	Model 3b	Model 4b	Model 5b	Beta[a] Model 5b
Self-competence	Intrinsic motivation				.165*** (.030)	.160*** (.031)	.203
	Personal resilience				.246*** (.035)	.211*** (.034)	.227
	Social resilience				−.008 (.025)		
School engagement	Sense of belonging					−.042 (.024)	−.067
	Valuing					.081** (.029)	.110
	F (df1; df2)	9.091 (6, 754)	34.766 (7, 658)	30.861 (9, 720)	65.962 (6, 646)	58.253 (7, 626)	
	p	.000	.000	.000	.000	.000	
	Durbin–Watson	2.063	2.060	2.037	2.107	2.158	
	N	761	666	730	653	634	
	R²	.067	.270	.278	.380	.394	
	Adj. R²	.060	.262	.269	.374	.388	
	R²-change		.218	.005	.106	.008	
	F-change (df1; df2)		49.104 (4, 658)	837 (6, 720)	36.805 (3. 646)	3.920 (2, 626)	
	p F-change		.000	.541	.000	.020	

[a]Standardized regression coefficients

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

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