An Educational–Vocational Intervention: Through a Work–Life Orientation Program in Finnish Comprehensive Schools

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Abstract
Changes in student-affective entry characteristics were examined in an educational–vocational intervention at Finnish comprehensive school. The conceptual framework constructed from attitudes as learned dispositions (Fishbein & Ajzen, 1975) and self-determination (Deci & Ryan, 1985) was tested in a longitudinal study. A person-based survey questionnaire was designed, piloted, and validated. Spearman–Brown reliability was calculated. In the first observation, 669 (Time One Cohort), and in the second, 649 (Time Two Cohort) subjects (girls and boys) of mean ages of 14.5 and 16.0 years took the Web-based survey. The tested hypotheses were (a) variables of self-determination, self-regulation, and intrinsic and extrinsic motivation would emerge as attitudinal domains in work–life orientation; (b) the experiences during the implementation of a work–life orientation program would decrease the effects of seventh-grade student background factors at the end of the program in the ninth grade, and (c) work–life orientation would be effective and have efficacy in changing student attitudes in relation to further education and occupations. Three factors emerged in the Maximum Likelihood Factor Analysis. The factors Independence, Self-Direction, and Flexibility were used as the dependents in repeated measures in a general linear model. The factor means were subjected to a paired samples t test. There was development toward stronger Independence and Flexibility in the case of both genders. The boys had gained the girls’ seventh-grade lead at the end of the program. Self-Direction did not show any changes. Empirical findings tentatively supported the program’s efficacy in changing entry characteristics.

Keywords
attitude, gender, intervention efficacy, work-orientation program

Career awareness is fundamental to career exploration, preparation, and choice (Turner & Lapan, 2013). Activities intended to prepare students to make and implement satisfying choices are part of the developmental aims of vocational guidance and career education services (Lent & Brown, 2013). Students interact with their environment. Extensive research has been done linking different theoretical person–environment fit models with person–environment psychology. Major theories in career choice include the Minnesota Theory of Work Adjustment, Holland’s Theory of Vocational Choice and Adjustment, the Life Span, Life-Space Theory of Careers, and Social Cognitive Career Theory (see Hartung, 2013; Lent, 2013; Nauta, 2013; Swanson & Schneider, 2013). Parsons’s (1909) three-step approach elegantly incorporates a student–school–environment relationship in the context of further education and future vocation choice. A student has to achieve an understanding of his or her personal attributes, develop knowledge of the requirements and conditions of different choice paths, and finally be able to evaluate and use these two cognitive and attitudinal domains. School-based interventions are used to facilitate age- and situation-appropriate career behaviors across a lifetime (Herr, 2001; Jones, Dominguez, & Durodoye, 2011). Students deserve to develop positive career-related self-efficacy expectations and attributional styles. It is hoped that work–life orientation will be an effective, efficient program with efficacy in a curriculum-based school setting.

Guidance counseling and work–life orientation are integrated disciplines in the day-to-day school activities in the first six grades of comprehensive education in Finland. Through Grades 7 to 9, guidance and work–life orientation are given during class hours specified for these purposes and in individual guidance sessions between students and

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The objectives and goals are set at the national level, but they are specified and localized at the municipal level in the school systems. The national educational policy guiding work–life orientation (National Board of Education, 2004) lists two main purposes for work–life orientation. The first is to bring schools and the surrounding society closer, and the second is to facilitate student’s choices for future career and educational choices. The individual student choice processes of the latter goal are the focus of this research article as they are of primary interest to educators but are also of interest to educational policy makers in shaping formal education for today and tomorrow.

Following is a brief description of the structure of work–life orientation at the local school system level in the three participant school systems of this research article: Halikko School Board, 2004; Turku School Board, 2004.

- seventh grade: 1-day orientation to parents’ or acquaintances’ work and occupations.
- eighth grade: 1-day orientation to an enterprise.
- ninth grade: 1-week orientation to work life (work experience).

Ninth grade: 1-week orientation to work life (work experience).

Finnish municipalities are authorized to add specific local objectives to the general objectives decreed in the national educational policy. The objectives of Turku include:

- the advancement of study skills,
- social maturation of the student,
- development of knowledge and skills needed in setting life goals, and
- endorsement of ethnic and gender equality.

In this article, work–life orientation is approached from the perspective of an individual’s choice process in one major transition period during primary education. Young people have a choice of entering the world of work, or choosing to continue their education in either general or vocational education. The goals and objectives of work–life orientation indicate that students’ choice processes comprise cognitive, affective, and psychomotor objectives.

A student’s perceptions of self and the environment form the basis for self-guiding and regulating action in educational and occupational choice processes. Tapola and Niemivirta (2008) build on the conception that proposes that a student’s situational construal of the environment, affected by contextual and dispositional factors, in part determines the goals students choose. Professional teachers and behavioral scientists need data on person–environment interaction for cognitive achievement objectives and possible changes in the affective personal psychological domain. In the present-day education environment in Finland, there seems to be a prevailing tendency to emphasize the measurement of cognitive achievement objectives rather than the measurement of individual personal psychological attributes. This emphasis could be because cognitive student performance objectives derived from curricula are comparatively easier to set and measure when compared with objectives in the affective domain. In schools, erosion of affective goal setting and measurement has been noted by Kratwohl and Bloom (1964).

Students’ paths in future educational and career choices are influenced by three main contexts. From Bronfenbrenner’s (1979) adolescent development research, the environments relevant to the topic of this article arise: school, the world of work, and home and peers. Educating and schooling a person can be argued to comprise three behavioral linear dimensions that form the trilogy of (a) affection, (b) cognition, and (c) conation as antecedents to actual behavior. At about age 11, students enter the tentative stage and begin to become aware of themselves in relation to the world of work (Turner & Lapan, 2013). Peer relations can serve as an egalitarian testing ground for adolescents and their ideas (Kiuru, 2008). Kirjavainen (2009) mentions family background, referring to the Coleman report (Coleman et al., 1966), to be one of the key inputs in the educational process. The objectives and goals of work–life orientation in Finnish comprehensive schools, if expected to lead to hoped-for positive behavioral outcomes, must address individual needs, values, and goals. Several studies have hypothesized relationships between personality and career variables (e.g., congruence between interests, intentions, and choices; see Brown & Hirschi, 2013). These findings lead researchers and practitioners to a more thorough understanding of the need for career development and empirically supported career interventions (Turner & Lapan, 2013).

The human mind explores reality in complex ways. Self-regulatory systems and the social and physical environmental context influence and focus a perspective where self-regulation is seen as an interaction of personal, behavioral, and environmental triadic processes (Zimmerman, 2000). Self-regulation refers to self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals (Zimmerman, 2000). Self-regulation and self-regulatory systems involve self-efficacy. Self-efficacy refers to beliefs about one’s capabilities to organize and implement actions necessary to attain designated performance of skill for specific tasks (Zimmerman, 2000). Leaving aside actual behavior (observed acts) and focusing on the interaction of personal and environmental processes ease the researcher’s complex task to reveal and test the underlying covert structures of attitudes in a specific, empirically observed situation.

The term (concept) attitude has many different definitions in behavioral research. Fishbein and Ajzen (1975) point out that this understanding in many cases leads to intuitive selection of measurement procedures. This intuitive selection again is followed by apparently conflicting measurement results and different conclusions concerning the relation between attitude and other variables. This confusion may well be one of the reasons why empirical attitude research concerning adolescents’
choice paths of further education tracks and possible occupations has been somewhat limited in the Finnish comprehensive school system during the past decade.

Research on attitude can be divided into two major schools of thought. Gable (1986) describes the two schools of thought as “undimensionalists and component theorists”; the first follows Thurstone’s (1946) definition of attitude as “the intensity of positive or negative affect for or against a psychological object. A psychological object is any symbol, person, phrase, slogan or idea toward which people can differ as regards positive or negative affect.” This, according to Gable (1986), makes “undimensionalists denote their conception from only an evaluative (positive–negative or favorable–unfavorable) aspect.” The second school of thought, component theorists, conceive of attitudes on more than just one evaluative dimension and follow Wagner’s (1969) definition: “An attitude is composed of affective, cognitive and behavioral components that correspond, respectively to one’s evaluation of, knowledge of, and predisposition to act toward the object of the attitude” (Wagner, 1969, p. 7). Gable (1986) defines the three components in the following way: (a) the cognitive component is a belief or idea, which reflects a category of people or objects; (b) the affective component represents the person’s evaluation of the object or person, and is the emotion that charges the idea, and (c) the behavioral component represents overt action directed toward the object or person. Attitudes are learned and may reflect a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object (Fishbein & Ajzen, 1975). Attitudes encompass cognitive (beliefs or knowledge), affective (emotional, motivational), and performance (behavior or action tendencies) components (Aiken, 1980). A distinction is made between a belief and an attitude, where a belief relates to the information a person has about an object, and an attitude denotes an individual’s feelings and evaluations of the object (Fishbein & Ajzen, 1975). Self-regulatory skills trigger personal motivation. Beliefs form the foundation of attitudes.

Individuals continually make conscious and unconscious choices (Eccles, 1994). In a report, the European Commission (2001) has pointed out that all educational systems require evaluation and steering at national, local, and school levels. School systems are seeking the best ways to report school performance. Finnish schools, in terms of outcomes of national education goals of their students, are expected to perform in seven major cross-subject (intersubject) areas. These areas are: (a) growth as a human being; (b) cultural identity and internationalism; (c) communication and media skills; (d) active citizenship and entrepreneurship; (e) responsibility for the environment, well-being, and sustained development; (f) safety and traffic, and (g) relationship to technology (National Board of Education, 2004).

Few or no empirical studies of person–environment attitude variables of the work–life experience–vocation–education intervention program in Finnish basic education have been published. The thin layer of empirical research is the motivation for this study and indicates its significance. Educators and planners must also strive for a better understanding of the validity of education for an individual; empirical evidence is needed to aid in defining appropriate strategies for change at a national and international level (UNESCO, 1996). To evaluate program processes and efficacy, researchers and educators must be able to assess the student characteristics at the beginning and end of an educational program.

The a priori content categories for attitude measurement in this article were constructed for psychometric measurement of a student’s self-regulatory certainty of continuing education and choice of occupation, and a student’s self-regulatory orientation toward continuing education and occupations. The guidance and regulation of actions take place through individual developmental phases during which an individual forms perceptions of reality. Eccles (1994) stated that expectations for success, confidence in one’s abilities to succeed, and personal efficacy have long been recognized by decision and achievement theorists as important mediators of behavioral choice (Atkinson, 1964; Bandura, 1977, 1986; Lewin, 1938; Weiner, 1974). Eccles (1994) further showed that parents and teachers could influence individuals’ perceptions of their field of options, and peers could affect the options seriously considered by either providing or withholding support for various alternatives. Earlier, person–environment fit models were introduced. Social Cognitive Career Theory helps in making school personnel aware of factors, including race/ethnicity, culture, gender, socioeconomic status, age, and disability status (Lent, 2013) that might influence student options or decisions. For this article, two of the above-mentioned factors were the most relevant, namely, age and gender. All school units implementing work-orientation in this study shared the following stratifying variables: (a) Schools were state/municipality financed; (b) gender was mixed; (c) The geographic location was a city (town), and (d) The state school system was the comprehensive school. Earlier analysis of vocational counseling intervention effectiveness has included interventions and a target age group (see Perdrix, Stauffer, Masdonati, Massoudi, & Rossier, 2012), and interventions and gender (see Brown & Ryan Krane, 2000).

Students’ beliefs of and attitudes to further education and vocations interact in complex ways. Rummel (1970) noted that the real world should not be treated as though phenomena coagulated in unrelated clusters, and as phenomena could be interrelated in clusters, so the clusters themselves could be related. John Dewey (1953, 1997) saw a child engaged in occupation and activities reproducing or running parallel to some form of work in social life. I hypothesized students’ background factors and guidance factors to link with the experiences guided by self-regulation, self-efficacy, intrinsic and extrinsic motivators, and self-determination (see Figure 1).
Variables of self-determination, self-tested in this study were: determine possible affective changes. The hypotheses to be and not only for cognitive achievement objectives but also to in relation to educational and vocational choice processes. The first observation took place before students (seventh-grade cohort) had completed the ninth-grade work–life orientation module, and the second observation was done after the same students had completed the module (ninth-grade cohort). My interest was in estimating the hypothesized variations in cohort characteristic. Panel study cohort analysis was used that referred to students who had experienced work–life orientation, and compared them with regard to dependent variables measured at two points in time (see Glenn, 2005).

The psychometric test design combined the philosophies of functional and trait designs. Functionality was approached from a general application viewpoint where the test was determined by its use and trait design was used to measure hypothesized traits as representations of variations in attitudes (see Rust & Golombok, 1999). The functionality approach used in test construction was the breakdown of a curriculum-based educational–vocational intervention program into relevant, valid local criterion-based variables.

1. **Hypothesis 1**: Variables of self-determination, self-regulation, and intrinsic and extrinsic motivation would emerge as attitudinal domains in work–life orientation.

2. **Hypothesis 2**: The experiences during the implementation of work–life orientation program would decrease the effects of seventh-grade students’ background factors at the end of the program in the ninth grade.

3. **Hypothesis 3**: Work–life orientation program would be effective and have efficacy in changing student attitudes in relation to further education and occupations.

**Experiences**

The general theory framework previously mentioned was the basis of the factor-analytic approach of psychometric testing in this research. Factors were to be located, measured, and modeled in the empirical context of choice of and orientation to a person’s future occupation and further education during the implementation of a Finnish work–life orientation program. Data were expected to give empirical evidence for salient certainty and orientation attitude factors. The results of factor-analytic psychometric tests are of theoretical interest and should be wrighted into educational theory (Kline, 2000). It is hoped that the results of this particular case of education–vocation intervention program will advance educational theory and give empirical evidence of the intervention program’s efficacy. The Finnish researcher Tuomo Lähdeniemi (1993) remarked,

> As in most European countries, work experience has become a permanent part of the school curriculum. A concerted attempt is made in Finland to match the pupil’s needs with places that are available with local companies. The emphasis once again is on making this experience as active as possible, but now that it has become established there is some evidence that it is settling down into rather humdrum routine. (p. 206)

If this were the case today, it would indicate the need for the learner and professional educator to assess the beliefs and attitudes concerning the work–life orientation program. Are we repeating a routine without really knowing if the program is efficient in helping the student in his choice process?

A connection to a priori content categories of attitude entry characteristics was examined before (Test 1) and after (Test 2) work–life orientation module completion. The results were expected to deepen an understanding of the phenomena of students’ formation of attitudes, and give data of the efficacy of the work–life orientation program in the upper level of the Finnish comprehensive school system. I reported earlier a need to gather data on student performance in relation to educational and vocational choice processes and not only for cognitive achievement objectives but also to determine possible affective changes. The hypotheses to be tested in this study were:

Students’ backgrounds, guidance, and experiences affect attitudes. Work–life orientation at school can be considered to be one of the key processes to bring about changes in attitudes to further education and occupations at the end of comprehensive school system.

**Method**

**Test design**

The overall test design of this study was a longitudinal survey study design (see Oppenheim, 1992). Two measurements were made of the approximately same cohorts. The respondents were identified by name, grade, home class designation, and response time in the data. The two compared cohorts were approximately closed, and the gathered data (cohort characteristics) from the two observation points were reasonably comparable (see Glenn, 2005). Due to the characteristics and structure of the Finnish national school system, student attrition during the past 3 years of compulsory elementary education was low (see Statistics Finland, 2010; Statistical Yearbook of Education, 2011). It was also in my interest to estimate changes in selected cohort characteristics and not to estimate the effects of age and period (see Glenn, 2005).

The first observation took place before students (seventh-grade cohort) had completed the ninth-grade work–life orientation module, and the second observation was done after the same students had completed the module (ninth-grade cohort). My interest was in estimating the hypothesized variations in cohort characteristic. Panel study cohort analysis was used that referred to students who had experienced work–life orientation, and compared them with regard to dependent variables measured at two points in time (see Glenn, 2005).

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(Rust & Golombok, 1999). The synthesis of function (national school system with local curriculum adaptation) and trait (education and work–life related individual attitude variables) designs was the rationale for creating the measurement instrument in this research. The test design of this research article is built on the theory of true scores (see Rust & Golombok, 1999). Following Vernon’s (1960) argument, the test was designed to be valid in measuring a work–life orientation program in relation to student entry characteristics, and the possible changes in them brought by the implementation of the program. The test was designed to serve face validity and increase the answer motivation of the participating students (Kline, 2000). As previously mentioned, it was hoped that the results of this particular case of education–vocation intervention program would advance educational theory and give empirical evidence of the intervention program’s efficacy. The test instrument was designed for this research need.

**Participants**

The samples for this study were drawn from the municipal school districts of Halikko, Salo, and Turku. For standardization of the test, sampling was based on stratified sampling and special group norms (see Kline, 2000). The questionnaire used in this study was developed comparing groups of respondents and their performance as groups so establishing norms was not considered to be crucial (see Rust & Golombok, 1999). The stratifying variables used in sampling were state financing, mixed gender, city (town) schools, and the comprehensive school state system.

Halikko, Somero, and Turku all had one school participating, while Salo had three. This covered all the seven to nine grade school units in Halikko, Somer, and Salo, and one of the eight schools in Turku. The participating school districts had the following enrollments in the seventh grade during the school year 2007-2008: Halikko, 135 students; Salo, 431, and Turku, 1,262 students. Survey answers were received from the students as follows: Halikko, 133 (99%); Salo, 399 (93%); and Turku, 137 (11%); thus, they formed a sample of 669 subjects in the Time 1 measurement (354 girls and 315 boys of the mean age of 14.5 years).

The second observation was conducted during the spring term of the school year 2009-2010 (Time 2). The consolidated municipal school district of Salo (Salo, Halikko, and Perniö) had an enrollment of 577 students, and 525 answers were received (90%). Turku City had an enrollment of 1,337, and 124 answers were received (9%). The sample consisted of 649 students (341 girls and 308 boys of the mean age of 16.0 years).

**Materials and Procedure**

For the survey, 28 bipolar statements were prepared in the format of Likert’s Summated Rating Technique. The questionnaire was a person-based questionnaire of attitude (Rust & Golombok, 196, 1999) and created for attitude measurement (see Oppenheim, 1992). The questions were presented in the native language of the students (Finnish) and were translated into English for this article by the author. Agreement was used as the answering format in a five-step bipolar dimension. Gable (1986) after reviewing research on the number of question steps, has come to the conclusion that “on the basis of research reported, the reliability and validity issues seem to be best served through the use of from five to seven response categories” (p. 5). Attention was paid to practical and empirical considerations (see Cronbach, 1946; Gable, 1986), and establishing face validity (Kline, 2000) through increasing the motivation of the respondents with items relevant to the work-orientation program objectives and goals and fitting in the life-space and life span of the students. Content validity (Kline, 2000) was targeted by choosing response items promoting self-awareness and avoiding response sets generating socially desirable answers. All categories of the response continuum were labeled, and horizontal verbal labels were chosen considering the ages of the respondents, and the number of formal school years, 6 plus and 9 plus school years, respectively. Construct validity of the test was established through a factor-analytic approach setting up the test derived from the nature of the variables (Kline, 2000).

**Procedure**

The first step in developing the questionnaire was to develop the content area and manifestation specifications that provided the blueprint (see Rust & Golombok, 1999). This phase of the survey included item reviews administered by interviewing two directors of education (school superintendents), two comprehensive school principals, and four guidance counselors from the participating school systems and schools. The interviews were conducted by the author in the fall of 2007.

A pilot study was conducted in the Halikko school district (n = 129) in the fall of 2007. An item analysis was made after piloting. After the analysis, I changed the item wordings and overall layout of the Internet survey to improve the simplicity, clarity, and reliability of the scale design. The response style of this person-based rating-scale questionnaire was changed. The pilot questionnaire had had a five-statement format: I strongly agree, I agree, I cannot tell, I disagree, and I strongly disagree. This was changed to a bipolar format (see Table 1). Of the 27 items in the pilot study, five items were dropped (willingness to perform demanding physical work, willingness to work alone, size of the future work-site, willingness to work as an entrepreneur). These four statements were not age appropriate. The fifth omitted item, “my occupation must preserve nature” did not contribute to the study and had a strong tendency to elicit biased answers. Six items related to self-regulation,
motivation, and self-determination replaced the omitted response statements. After revisions to the piloted questionnaire, a Spearman–Brown split-half reliability test (odd–even) was administered in IBM SPSS. The Spearman–Brown coefficient was .7, which was satisfactory for a person-based questionnaire (Rust & Golombok, 1999).

Two Internet surveys were done: the first before the seventh-grade cohort had participated in the 1-week work–life orientation module (Time 1), and the second (Time 2) after the ninth-grade cohort had completed the work-orientation module. The surveys were completed under teacher supervision at school to improve response reliability.

The independent variables were chosen to connect with the respondents’ life spaces and life spans (see Super, 1980). Relational influences on career development are important contextual factors in the choice processes concerning education and vocations (see Kenny & Medvide, 2013). The independents were (a) gender, (b) father’s or guardian’s education, and (c) mother’s or guardian’s education. Research has shown that gender relates to vocational aspirations, vocational interests, and self-efficacy expectations (Turner & Lapan, 2013). Super (1980) identified developing meaningful relationships with family as having important consequences for fostering career awareness, and thus, parents’ educational levels could be anticipated to have effects on attitudinal orientation to further education and vocations.

Nine variables were chosen from the 28 survey items as dependent attribute variables to measure the hypothesized attitude domains of self-determination, self-regulation, and extrinsic motivation in relation to further education and occupations. Teenagers live in a fast-changing world and meet with diverse expectations. It can be argued that the recognition and understanding of salient attitudinal variables in variance with choice of education and occupation are now needed more than ever in work- and education-related counseling in schools. From a professional educator’s viewpoint, attribute variables of Independence, Self-Direction and Self-Guidance, and internal and external motivators were relevant. Table 1 presents attitude attribute items and the bipolar variable structure used in the survey.

The survey data were subjected to statistical analyses using SPSS version 17.02 and PASW 18.03. The data (missing listwise) were examined for its technical properties for factor analysis and further multivariate analysis of variance (Table 2).

The distributions of the measured variables (univariate) did not show severe problems of distributional assumptions (skewness > 2; kurtosis > 7). They met the univariate normal distribution assumption (see Table 2). I examined the correlation matrix of the nine variables to see if weak interitem dependency should exist, or too high correlations would indicate multicollinearity. The nine dependent variables were subjected to Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity in SPSS. The dependent variables were found to be intercorrelated (KMO .63; approximately \( \chi^2 = 954.42; df = 36; p = 000 \)). I decided to continue with factor analysis, which I chose as an expression of the general linear model (GLM),
and to follow the multivariable research framework of this study (see Kerlinger, 1992). Factorial design also enabled study of the variables in combination (Oppenheim, 1992).

**Results**

As mentioned earlier (see the section “Test design”), trait design was used to measure hypothesized traits as representations of variations in attitudes (see Rust & Golombok, 1999). Research with factored tests can lead to a greater understanding of the determinants of educational success and failure (Kline, 2000). Factor analysis mirrors the cognitive processes whereby human beings actually make judgments about differences in objects (Rust & Golombok, 1999). For general usage and psychometric requirements of factor analysis, see Rust and Golombok (1999). The survey questionnaire used in this research had been prepared to meet the requirements of personality questionnaires of factorial model (for extensive evaluation of questionnaires of this model, see Kline, 2000).

The method in extraction was Maximum Likelihood with Direct Oblimin rotation. The initial factoring extracted nine factors. Based on the a priori attitude structure used in this study, and after consulting the scree plot, I chose a three-factor solution. Factor loadings less than .3 were suppressed to aid the interpretation. The data reduction revealed three-factor domains, which I labeled descriptively Independence, Self-Direction, and Flexibility. The first factor accounted for 22.98% of variance, the second, 20.43%, and the third accounted for 16.11%, thus explaining 59.52% of the total variance. The factor structure is presented in Table 3, the factor correlations and the factor means are shown in Table 4. The Self-Guidance Want variable had a rather low loading (.42) on Factor Self-Direction, but I wanted to retain it to strengthen the factor (not less than three items).

The reliability, Cronbach’s alpha (internal consistency) of the scale was .7 for the items in Independence, .6 in Self-Direction, and .6 in Flexibility. For factor-level analysis, the mean variables of sum for Independence, Self-Direction, and Flexibility were computed.
**Table 4.** Factor Correlations, Factor Scores, and Factor Means of Independence, Self-Direction, and Flexibility.

| Factor correlation              | Independence | Self-Direction | Flexibility | Factor mean | SD |
|--------------------------------|--------------|----------------|-------------|-------------|----|
| Independence                   | 1.000        | .077           | −.148       | 3.65        | .88 |
| Self-Direction                 | .077         | 1.000          | .055        | 3.45        | .74 |
| Flexibility                    | −.148        | .055           | 1.000       | 2.38        | .79 |

Note. Factor scores are computed from factor loadings > 40.

**Table 5.** Changes of the Means of Independence, Self-Direction, Flexibility, Paired Correlations, and Paired Differences.

| Variable | Paired means | Paired correlations | Paired differences |
|----------|--------------|---------------------|--------------------|
|          | Time one     | Time two            | 95% CI             |
|          | 𝑀        | 𝑁      | SD | 𝑀 | 𝑆𝐷 | 𝑀 | 𝑆𝐷 | LL | UL | df | 𝑝  |
| Independence | 3.65 | 648 | .88 | 3.95 | .90 | .016 | −.40 | −.21 | 647 | .000 |
| Self-Direction | 3.44 | 643 | .74 | 3.45 | .69 | .000 | −.07 | .08 | 642 | .896 |
| Flexibility | 2.38 | 646 | .79 | 2.57 | .68 | .019 | −.28 | −.12 | 645 | .000 |

Note. 𝑝 < .05. Significance is two-tailed. Time 1 is the seventh-grade cohort in 2008. Time 2 is the ninth-grade cohort in 2010. CI = confidence interval.

**Method of Analysis of the Person-Based Test**

The two observation points, Time 1, seventh grade, and Time 2, ninth grade, were entered as the within-subjects factors for statistical analysis of the traits of factors. Gender, father’s three education levels, and mother’s three education levels were entered as the between-subjects factors one by one into repeated measures (RM) in the GLM. Independence, Self-Direction, and Flexibility were the dependent variables. Statistics were computed using 𝛼 = .05. Box’s M test (Equality of Covariance Matrices) results for three designs of Grade × Gender, Grade × Father’s Education, and Grade × Mother’s Education 𝑝(𝑀) < .05 were .226, .353, .970, and not significant. Thus, they did not violate the assumptions of the multivariate model and multivariate tests. Results significant at the 𝑝 < .05 level were reported from the multivariate output and the 𝐹 values were exact statistics.

Levene’s tests (Equality of Error Variances) for Independence, Self-Direction, and Flexibility were .257, .944; .211, .121; .085, 130 for Gender, .541, .780; .822, .358; .328, .375 for Grade × Father’s Education, and .484, .495; .093, .250; .694, .564 for Grade × Mother’s Education and met the assumptions of GLM repeated measures for univariate models. The univariate tests were computed using 𝛼 = .05.

**Multivariate Effects**

I found the designs Grade and Grade × Gender statistically significant for the multivariate effects in within subjects. Wilks’s lambda for Grade was .89, 𝐹(25.5), 𝑝 = 000, Observed Power 1.00, and for Grade × Gender .97, 𝐹(5.7), 𝑝 = .001, Observed Power .95.

**Between-Subjects Effects**

Gender had a statistically significant effect on Independence, 𝑑𝑓 = 1, 𝐹(5.9), 𝑝 = .016, Observed Power .68.

**Univariate Effects**

The Univariate Tests showed statistically significant effects of Grade and Independence, and Grade and Flexibility, 𝑑𝑓 = 1, 𝐹(48.5), 𝑝 = 000, Observed Power 1.00; 𝑑𝑓 = 1, 𝐹(28.4), 𝑝 = 000, Observed Power 1.00. Statistically significant effects were also found for the effects Grade × Gender and Independence, and Grade × Gender and Flexibility 𝑑𝑓 = 1, 𝐹(6.6), 𝑝 = .011, Observed Power .73; 𝑑𝑓 = 1, 𝐹(10.8), 𝑝 = .001, Observed Power .91.

**Comparison of the Means of the Two Observations**

The paired samples 𝑡 test of PASW showed statistically significant differences in the means of Independence and Flexibility (see Table 5). The paired means of Self-Direction did not show statistically significant changes. Graphic comparisons of the estimated marginal means of boys’ and girls’ answers in the three factors are presented in Figures 2, 3, and 4.

**Conclusion**

The Finnish work–life orientation program (WLO) and its work experience periods (modules; WLOM) provide a platform for two basic strategies for attempts to produce change in attitudes: (a) active participation and (b) persuasive
communication. Both of these strategies relate to student life-space and life span, and person–environment fit. Self-regulatory efficacy beliefs have been shown to causally influence human regulatory processes (Zimmerman, 2000) and are manifested in work-orientation educational–vocational intervention. These beliefs have effects on peer pressure resistance (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) and goal setting (Zimmerman & Bandura, 1994). Self-regulatory skills are triggered by an individual’s motivation. Eccles (1994, 592) has shown that expectations for success, confidence in one’s abilities to succeed, and personal efficacy have long been recognized by decision and achievement theorists as important mediators of behavioral choice (Atkinson, 1964; Bandura, 1977, 1986; Lewin, 1938; Weiner, 1974). Parents and teachers can influence individuals’ perceptions of their field of options, and peers can affect seriously considered options by either providing or withholding support for various alternatives (Eccles, 1994). Deci and Ryan (1985) have suggested that motivational theories have to address two aspects: (a) energy that is fundamentally a matter of needs, and (b) direction, which concerns the processes and structures of the organism that gave meaning to internal and external stimuli. Furthermore, Pintrich (2000) has indicated a need for models of self-regulated learning that include motivational and cognitive processes.

The following three hypotheses were tested and addressed in this article:

1. Variables of self-determination, self-regulation, and intrinsic and extrinsic motivation would emerge as attitudinal domains in work–life orientation;
2. The experiences during the implementation of the work–life orientation program would decrease the effects of seventh-grade students’ background factors at the end of the program in the ninth grade, and
3. The work–life orientation program would be effective and have efficacy in changing student attitudes in relation to further education and occupations.

The study followed a longitudinal study design, which brought concerns with cohort comparison due to attrition and leakage (see Glenn, 2005). Samples in this study, however, could be argued to be approximately closed and representative of the Finnish comprehensive school seventh- to ninth-grade student population (see section “Test design”) and thus fulfill the general requirement for cohort analysis (Glenn, 2005). Face validity (Kline, 2000) of the test was established through increasing the motivation of the respondents with items relevant to the work-orientation program objectives and goals and fitting in the life-space and life span of the students. Content validity (Kline, 2000) was striven at choosing response items promoting self-awareness and avoiding response sets generating socially desirable answers. Construct validity of the test was established through piloting and item analysis (see section “Procedure”) and with factor-analytic approach setting up the test derived from the nature of the variables (Kline, 2000). Problems remained in addressing and controlling background variables related to the effects of the social maturation of the students during the elapsed 3 school years. In longitudinal survey designs, many intervening variables may influence the effects (Oppenheim, 1992). Variables of self-determination and self-regulation can be debated to be relatively enduring personality traits in relation to occupational attainment (see Brown & Hirschi, 2013), and these variables built on the theoretical basis of this study and pilot work. The conclusion drawn from the empirical data of this study is tentative and need further study to be generalized psychometrically.

The psychometric reliability of the test used in this study was that of internal consistency reliability. The minimum of .7 of a good test (Kline, 2000) was reached. Due to the test design, test–retest reliability could not be calculated. The reliability, Cronbach’s alpha (internal consistency) of the scale was .7 for the items in Independence, 6 in Self-Direction, and .6 in Flexibility, which can be defended to be satisfactory in behavioral attitude measuring.

Three attitude domains related to respondents’ self-determination, self-regulation, and intrinsic and extrinsic motivation emerged from the data: Independence, Self-Direction, and Flexibility. This finding was hoped to add to the research concerning hypothesized relationships among personality and career variables (see Brown & Hirschi, 2013; Turner & Lapan, 2013), and in generating empirical evidence so as to be of help to vocational guidance counseling at school. After completion of the work-orientation intervention program, changes in the scores for Independence and Flexibility were detected. There was development toward stronger Independence and Flexibility for both genders, which could cautiously be interpreted to show the effect of the intervention in decreasing the affective entry characteristics of these domains. It was not possible to control the students’ general maturation process; therefore, caution should be used in interpreting the results. The boys had gained the girls’ seventh-grade lead start at the end of the ninth grade, which gave tentative support for the gender equality and equity promotion objectives of the program. This may be indicative of a lessening of the effects of gender-based circumscription of vocational aspirations (Gottfredson, 1981, 2002, 2005) and remind researchers not to overlook gender differences in students’ orientations to education and to the world of work. I did not find evidence for changes in Self-Direction. The finding could be taken as a sustainable latent attitude domain of the choice process, which needs further research and analysis.

The empirical findings of this study gave evidence that students were self-regulated and self-determined learners during the WLO at school. One of the respondents wrote aptly, “I like it the best when I can act on my own initiative. I don’t like it when somebody is always breathing down my neck and giving advice. When I need help, then I’ll ask for it.” (translation)

Were the findings the result of work-orientation at school and workplaces, or did they originate in the general age-related maturation process of the students? Changes had taken place, which could be taken as evidence of the overall effectiveness and efficacy of the WLO and WLOMS. To validate the efficacy of the work-orientation educational–vocational intervention program, further research is needed.

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