

Profiles of early career insecurity and its outcomes in adolescence: A four-wave longitudinal study

Saija Mauno^{1,2}  | Katharina Klug³ | Johanna Rantanen¹ | Joona Muotka¹ |
 Noona Kiuru¹

¹Department of Psychology, University of Jyväskylä, Jyväskylä, Finland

²Faculty of Social Sciences and Humanities (Psychology), Tampere University, Tampere, Finland

³Faculty of Business Studies and Economics, University of Bremen, Bremen, Germany

Correspondence

Saija Mauno, Faculty of Social Sciences (Psychology), Tampere University, Kalevantie 4, Tampereen yliopisto, 33100 Tampere, Finland.

Email: saija.mauno@tuni.fi

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Abstract

This study investigated the developmental profiles of perceived early career insecurity (ECI) and their outcomes among adolescents ($n = 1416$) during a critical educational transition from basic education to upper secondary education. We found three distinct latent profiles with varying amounts of ECI: Profile 1: Moderate and decreasing ECI before the transition (57%); Profile 2: Low-decreasing ECI before the transition but increasing ECI after the transition (31%); and Profile 3: High and stable ECI during the transition (12%). Moreover, the ECI profiles related to school and life satisfaction as well as to school stress and dropout intentions in a meaningful way consistent with the stressor hypothesis. Chronically high and increasing ECI was related to negative outcomes.

KEYWORDS

adolescents, early career insecurity, longitudinal study, negative consequences, stress, transitions

INTRODUCTION

Contextual background and aims

Career/employment insecurity can be defined as an individual's overall concern regarding the attainment, continuity, and stability of one's career or employment manifesting, for example, as worries about career decision-making, entrance to the workforce, and job loss or unemployment (see De Witte et al., 2016; Hayden et al., 2021; Karamessini et al., 2019; Sampson et al., 1998; Shoss, 2017; Spurk et al., 2016, 2022). Career/employment insecurity can be a notable stressor for individuals in today's turbulent labor market (De Witte et al., 2016; Shoss, 2017; Sverke et al., 2002, 2019), particularly for young people because they often lack work experience, making them more susceptible to feelings of insecurity (Karamessini et al., 2019; Klug, 2020). This *stressor hypothesis* has also gained support in empirical studies showing the detrimental costs of career/employment insecurity for individuals' well-being,

health, and motivation in several meta-analyses and reviews (e.g., Cheng & Chan, 2008; De Witte et al., 2016, 2018; Sverke et al., 2002, 2019).

Earlier research on career/employment insecurity has mainly focused on working adults (Griep et al., 2021; Kim & Kim, 2018; Kinnunen et al., 2014; Klug, 2020; Klug, Bernhard-Oettel, et al., 2019; Klug, Drobnič, & Brockmann, 2019) but here we propose that this stressor may cause worries even before individuals enter the workforce. A core feature in such perceptions of insecurity is an individual's uncertainty about the future in relation to their employment and career prospects over the life course (De Witte et al., 2016; Spurk et al., 2022). This, in turn, signifies that individuals may experience such uncertainty and insecurity also at earlier age, for example, during career planning- and decision-making in adolescence (Gati & Kulcsár, 2021; Hirschi & Koen, 2021; Kiuru et al., 2021; Sampson et al., 1998). To refer to this phenomenon we use a specific term, *early career insecurity* (ECI), which encompasses feelings of insecurity about one's educational, vocational, and career prospects in the future

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during early educational, career-related transitions that typically occur in adolescence (Kiuru et al., 2021).

Indeed, ECI might be a particular concern in increasingly dynamic work-life contexts (Hirschi & Koen, 2021; Spurk et al., 2016). Nowadays, young individuals have to navigate their educational and career paths in often unpredictable and fast-changing environments characterized by occupational erosion due to rapid technological development and by difficulties in forecasting what sorts of vocational skills and competences will be needed in future working life (Ferrari et al., 2018; Gati & Kulscár, 2021; Hayden et al., 2021; Hirschi & Koen, 2021; Hoff et al., 2022; Khattab et al., 2022; Klug, 2020). Also, contemporary career theories, e.g., cognitive information processing theory (CIP; Osborn et al., 2013; Sampson et al., 2004), which focus on career decision-making and insecurity in transition stages, underscores the external contextual factors underlying career decisions and actions. Adolescence, the life stage we focus on, often also includes internal uncertainty because various *developmental tasks*, such as building one's vocational identity as a part of overall identity formation (e.g., Marcia, 2014; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008), need to be accomplished simultaneously and may even “pile up” (Ferrari et al., 2018; Havighurst, 1972; Larson & Ham, 1993). Increasingly, this career-related decision-making occurs in unpredictable environments, which may add to the uncertainty related to educational and vocational decisions (Gati & Kulscár, 2021; Hayden et al., 2021; Hirschi & Koen, 2021; Hoff et al., 2022).

We propose that the above-described external dynamic educational and work-life environmental factors, internal demanding identity formation, and career decision-related developmental tasks create a fruitful soil for investigating ECI in adolescence. Furthermore, we consider also the possibility that this development is not always linear and smoothly progressing but may also include many individual variations (see, e.g., Galambos et al., 2003; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008). Accordingly, the first goal of this study is to investigate the heterogeneity in the developmental profiles of the experiences of ECI among adolescents during a critical transition from the ninth grade of comprehensive education to upper secondary studies (from ages 14 to 17) including the first actual career-related transition in adolescence. Moreover, we also investigate how developmental profiles of ECI are associated with contextual and non-contextual well-being outcomes to explore whether ECI acts as a stressor in adolescence. Contextual outcomes, which are here school-related stress, school satisfaction, and dropout intentions, are often the most likely and proximal consequences of career/employment insecurity (e.g., De Witte et al., 2016; Sverke et al., 2002). However, more distal, non-contextual outcomes, such as individuals' happiness and health, may also be relevant outcomes of ECI (see Hayden et al., 2021; Osborn et al., 2013), and here we analyze life satisfaction as a context-free outcome.

Experiences of ECI in adolescence

Our first goal is to investigate developmental profiles of ECI among adolescents by analyzing ECI during the educational transition from the ninth grade of comprehensive education to upper secondary education (covering ages 14–17). Among these adolescents, this transition period includes the first career-related transition (choosing a vocational or academic educational track), which we explore via a person-centered approach (see Hofmans et al., 2020; Spurk et al., 2020; Wang et al., 2013). Specifically, we explore the heterogeneity of within- and between-individual experiences of ECI over time, which may also include non-linear change patterns (see Galambos et al., 2003; Seiffge-Krenke & Gelhaar, 2008). In our study, the person-centered analysis focuses on identifying the subgroups of adolescents progressing along different kinds of developmental trajectories of ECI.

The theoretical foundations for the person-centered approach in stress research can be found in the *transactional stress model* (Lazarus, 1999; Lazarus & Folkman, 1984), according to which the appraisal of environmental demands is always individualistic, signifying that individuals often experience even the same objective situation/demand differently. In this study, the pre-career decision about the “right” educational track can be seen as an environmental, but also as an internal developmental demand for adolescents which may include ECI (e.g., Galambos et al., 2003; Kiuru et al., 2021; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008). Consistent with the transactional stress model, we suggest that educational transitions in adolescence may be appraised individually. Indeed, many developmental tasks in adolescence may well have an individualistic “timetable” in spite of being simultaneously socially expected and normative (Galambos et al., 2003; Seiffge-Krenke & Gelhaar, 2008). On these grounds, we consider a person-centered analyzing method a meaningful tool for discovering different typical, but more importantly, also atypical developmental trajectories of ECI during educational transitions. In vocational psychology, person-centered analysis methods have been increasingly used due to their strengths in also unraveling non-linear and atypical career-related processes (see Hofmans et al., 2020; Spurk et al., 2020).

Based on the argument that ECI is appraised individually by adolescents, our first hypothesis states (H1) that we find different patterns of stability and change in ECI over time.

Since the educational transition from comprehensive education to secondary education also includes an age-specific, normative developmental task for all adolescents, we also approach ECI via the *developmental task model* by Havighurst (1972). According to this model (see also Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008), setting vocational goals and choosing the right educational track to achieve these goals are among critical developmental tasks in adolescence, which may also be worrying. Supporting this, many recent studies suggest that insecurity is very

likely experienced during these developmental tasks (Ferrari et al., 2018; Gati & Kulscár, 2021; Hirschi & Koen, 2021; Nurmi, 1993). Thus, experiencing ECI can be considered as a normative developmental phenomenon in adolescence (e.g., Galambos et al., 2003; Havighurst, 1972; Nurmi, 1993). However, according to the basic tenets of the developmental task (Havighurst, 1972) and the identity formation models (see Erikson, 1980; Marcia, 2014), we also expect that there are certain fluctuations in ECI as follows: ECI may be stronger before and during the educational transition, that is, covering the anticipatory and processing periods of this particular developmental task (e.g., Klug, Bernhard-Oettel, et al., 2019; Klug, Drobnič, & Brockmann, 2019). However, succeeding in making an educational choice and in moving from comprehensive education to secondary education, that is, being able to solve the first career-related developmental task (see Galambos et al., 2003; Havighurst, 1972; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008), should, in turn, decrease ECI during the stabilization period of this particular developmental task.

Accordingly, our second hypothesis (H2), specifying H1, states that we find an age-normative/typical profile in which adolescents experience higher ECI before and during the educational transition but report later a decrease in ECI, that is, after the transition to secondary education has occurred. This developmental pattern would characterize a group of adolescents who have successfully solved the age-normative developmental task indicating good adjustment (see Galambos et al., 2003; Havighurst, 1972; Marcia, 2014; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008).

However, it is also possible that certain meaningful non-normative/atypical profiles of ECI emerge in the data, which can be found via the person-centered methodology designed also to detect *unknown* heterogeneity in a target population (Hofmans et al., 2020; Wang et al., 2013). This is also consistent with the individualistic stress appraisal approach by Lazarus and Folkman (1984) referred to above as well as with the contemporary view that developmental tasks may also have individualistic timetables (Galambos et al., 2003; Seiffge-Krenke & Gelhaar, 2008). For these reasons, it is difficult to pose exact hypotheses on what such atypical profiles of ECI would look like in the data. For example, a group of adolescents may emerge scoring low on ECI across time (e.g., due to excellent school performance). However, one particularly interesting profile, considering early career interventions, would be those adolescents whose ECI is chronically high throughout the follow-up period. We propose that such a group of adolescents may well emerge, since, due, for example to their differences in career-preparedness (e.g., vocational interests, competences), not all adolescents are successful in making an educational transition that fulfills their goals and wishes (Galambos et al., 2003; Sampson et al., 1998, 2004). This again may mean more stable ECI for these adolescents.

Accordingly, our third hypothesis (H3) states that ECI may be a fairly stable experience over time for some adolescents,

signifying that we expect to find a group of adolescents experiencing at least moderately high ECI across the waves, that is, chronically higher ECI over time. This subgroup has not yet successfully accomplished the age-normative developmental task (e.g., Galambos et al., 2003; Havighurst, 1972; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008), and may also display psychological maladaptation and negative stress outcomes (constituting a risk group), as discussed next.

ECI as a harmful stressor with negative outcomes

The second aim of this study is to explore how the profiles of ECI are associated with contextual and non-contextual outcomes regarded as stress outcomes. Exploring this association means that, in addition to age-normative experience (see Havighurst, 1972; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008), we also regard ECI as a potential *stressor* for adolescents. There is already convincing evidence showing that career/employment insecurity is a notable stressor with various negative outcomes among working adults (e.g., Cheng & Chan, 2008; De Witte et al., 2016; Hayden et al., 2021; Spurk et al., 2016, 2022; Sverke et al., 2002, 2019). We assume that this same stressfulness also concerns ECI experienced in adolescence. Different theoretical models are applicable in explaining ECI as a stressor. Here, we apply one influential psychological stress model mentioned already, that is, the *transactional stress theory* (Lazarus, 1999; Lazarus & Folkman, 1984).

The transactional stress theory does not only suggest that stress appraisal is individualistic but also underlines that stress appraisal determines stress outcomes (Lazarus, 1999; Lazarus & Folkman, 1984). If an environmental or internal demand (e.g., demands for career decisions and transitions) is appraised as threatening, stress reactions which are negative for well-being, health, and motivation are likely to follow, particularly if stress management (via coping) is unsuccessful. Moreover, at an individual level, career/employment insecurity often emerges along with feelings of uncontrollability (Hayden et al., 2021), which may explain the stressfulness of a situation and prevent effective stress management (Lazarus, 1999; Lazarus & Folkman, 1984). Also, adolescents may experience such uncontrollability due to various internal and external demands described earlier when confronting with career decisions and educational transitions as normative developmental tasks in adolescence (Havighurst, 1972; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008). Consistent with this, previous studies have shown that adolescents are not merely faced with many new normative environmental demands and psychophysiological changes but are also more reactive to these events compared to younger children, showing more adverse stress reactions to these demands (e.g., Gunnar et al., 2009; Larson & Ham, 1993; Stroud et al., 2009).

Despite the above-described theoretical reasoning, the harmful consequences of ECI (i.e., stress outcomes)

have not been studied among non-working adolescents. However, there is some empirical evidence of the negative effects of ECI among younger workers. Taht et al. (2020) showed, in a large multi-sample study covering 28 EU countries, that poorer labor market position, including employment insecurity, was associated with young employees' impaired well-being, e.g., lower life satisfaction and higher negative affect. Klug et al. (2020), in turn, indicated that perceived employment insecurity, but not objective insecurity in terms of temporary employment, is associated with poorer mental health and lower job and life satisfaction over time among young newcomers in the labor market (see also Fiori et al., 2016). This finding held among differently educated individuals, suggesting that perceived employment insecurity might well have harmful ramifications for all younger individuals irrespective of their educational background. Finally, Alisic and Wiese (2020) indicated, among young scientists, that increases in career insecurity related to negative effects over time, such as lower self-management and self-efficacy. On the basis of the transactional stress theory (Lazarus, 1999; Lazarus & Folkman, 1984), the developmental task model (e.g., Havighurst, 1972; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008), and these previous findings, we pose the two following hypotheses concerning the associations between ECI and the selected outcomes.

Our fourth hypothesis (H4) states that the level of the outcomes depends on the level of the ECI and its fluctuations over time. Thus, when the level of ECI is high (e.g., during/before educational transition), adolescents report more negative stress outcomes, i.e., higher school stress and dropout intentions, alongside lower school and life satisfaction. This should occur at least synchronically (within the same time point). The converse will also hold; when the level of ECI decreases (e.g., after educational transition and being successful in accomplishing one developmental task), adolescents report fewer negative outcomes.

Furthermore, as there is already convincing evidence on the negative effects of chronically/stable high career insecurity among working adults, also concerning longitudinal studies (e.g., Alisic & Wiese, 2020; Kim & Kim, 2018; Kinnunen et al., 2014; Klug, 2020), we suggest that such findings will also be made for adolescents. Thus, our fifth hypothesis (H5) states that stable, chronically higher ECI (compared to other kinds of ECI profiles) is associated with more negative stress outcomes, either synchronically or/and over time.

Nevertheless, it is important to note that the hypotheses concerning the outcomes are ultimately conditional upon the hypotheses posed for the ECI profiles (H2 and H3) presented earlier. Indeed, we are not entirely sure what kinds of profiles will emerge due to the unknown heterogeneity in the data that we are investigating here by applying the person-centered methodology. However, certain profiles are theoretically more likely to emerge (e.g., according to the developmental task model), likewise their outcomes (e.g., risk profiles relate to poorer outcomes).

METHOD

Participants

This study is part of a broader longitudinal study (STAIRWAY – From Primary School to Secondary School Study) conducted in Finland which followed a community sample of adolescents during critical educational transitions from comprehensive basic education to secondary education. Generally, this educational transition is the first pre-career-related transition in adolescence in the Finnish educational system, as adolescents have to choose after finishing their comprehensive education (at the age of 15–16) whether to apply and move to an academic (i.e., high school) or a vocational (i.e., vocational school) educational track in their secondary education (see more <https://www.oph.fi/en/education-system>). We considered this pre-career transition to be a fruitful starting point to explore ECI.

Specifically, this project was carried out in two medium-sized towns in central Finland. Written consent to participate was collected from the participants and the research plan of the project was approved by the Human Sciences Ethics Committee of the local university. The present study includes four measurement points during the transition from lower to upper secondary education. The first two measurements were conducted in the ninth grade before the transition, that is ninth-grade fall (fall 2017, T1) and ninth-grade spring (spring 2018, T2). The second two measurements were conducted during the first year of upper secondary studies after the participants had moved on to upper secondary education (either upper secondary general education; academic track or upper secondary vocational education; vocational track): fall (fall 2018, T3) and spring (spring 2019, T4) of the first study year in upper secondary education.

This study included 1416 adolescents, out of whom 877 (62%) participated at T1 and 880 out of 1416 (62%) at T2 in the ninth grade before the educational transition. After the transition, 1255 adolescents out of 1416 (89%) participated at T3 and 1211 out of 1416 (86%) at T4 in the first year of upper secondary education. The numbers of participating adolescents were somewhat higher at measurement points after the transition, as 527 adolescents joined the study after the upper secondary education. Participants responded to the questionnaires during the school day at all measurement points.

Of the 1416 participants (in the baseline), 54% were female and 44% were male. The average age was 15.29 years at the outset (range 14.17–17.75). A total of 96% of adolescents spoke Finnish as their native language, whereas for 4% of the adolescents, their native language was something else. The sample was fairly representative of the Finnish general population, except for the fact that the mothers of the participants were somewhat more educated than women of the same age on average in Finland (see Mauno et al., 2021; Official Statistics of Finland, 2018).

Measures

Early Career Insecurity

ECI was measured with five questions adapted from the Finnish Youth Barometer (2017; see also Kiuru et al., 2021) at all four time points (T1, T2, T3, and T4). Adolescents were asked to evaluate their worries and expectations in relation to their future employment and career prospects. They were asked to answer on a 5-point Likert scale (1 = *not at all*, 5 = *very much*) the extent to which they are worried about whether (1) they get into the place of studies/school/vocational field they want, (2) they complete their vocational studies, (3) they will be employed/have a career in the future, (4) their income level will be sufficient in the future, and (5) they fear being left outside of working life in the future. Similar items have been included in career insecurity scales for adults (e.g., Spurk et al., 2016). Cronbach's alpha coefficients for different measurement points were .88, .87, .87, and .86, where a high score indicates higher ECI.

Contextual outcomes

These outcomes included *school-related* assessments, that is, school stress, school satisfaction, and intention to drop out of school. The *School Stress Scale* was adapted from the Health Behavior in School-Aged Children (HBSC) study (Currie et al., 2012; see also Kämpfi et al., 2012, for validity see Hoferichter et al., 2021), and it was included at each wave (T1, T2, T3, T4). Via this scale students reported their perceived school-related stress by answering four specific questions (e.g., "I have too much schoolwork", "I am getting tired because of the schoolwork") on a 5-point Likert scale (1 = *completely disagree*; 5 = *completely agree*). Mean scores were calculated across four questions to measure adolescents' school stress (range of scale 1–5) separately for each of the four time points, with higher scores indicating higher school-related stress. Cronbach's alpha coefficients for different measurement points were .79, .84, .86, and .85.

School satisfaction was measured via satisfaction with the educational track by using four particular items (e.g., Are you satisfied with your current form of education?) on a 5-point Likert scale (1 = *not at all*, 5 = *very much*). *Intention to drop out of school* (dropout intentions) was measured with two items (e.g., Have you considered changing your school or field of study and quitting the current one?) on a 5-point Likert scale (1 = *not at all*, 5 = *very often*). These outcomes were measured twice (T3 and T4). The mean scores for the items of school satisfaction and dropout intentions were calculated (range 1–5) separately for the autumn and spring of the first year of upper secondary education. Cronbach's alphas for the mean scores of school satisfaction were .90 in the autumn and .89 in the spring of the first year of upper secondary education. Cronbach's alpha coefficients for the mean scores of dropout intentions were .79 in the autumn and .83 in the spring.

Non-contextual outcomes

As employment insecurity may also predict more distal outcomes (see Sverke et al., 2002, 2019), we considered it important to include those in our study as well. For this purpose, *life satisfaction* was available in the data measured at all four time points (T1, T2, T3, and T4). Adolescents assessed their life satisfaction via the Satisfaction With Life Scale (Diener et al., 1985). In the Finnish version of this scale (for validity, see Mauno et al., 2018), adolescents were asked to answer five questions (e.g., "I am satisfied with my life" and "So far I have gotten the important things I want in life") on a 5-point Likert scale (1 = *completely disagree*; 5 = *completely agree*). Mean scores were calculated across five questions separately for each of the four time points to measure adolescents' life satisfaction (range of scale 1–5) separately, with higher scores indicating higher satisfaction with life. Cronbach's alpha coefficients for different measurement points were .89, .89, .88, and .88.

Analytical strategy

First, we explored what kinds of longitudinal profiles adolescents show in their perceptions of ECI during the follow-up moving from lower secondary to upper secondary education. This objective was investigated by using Latent Profile Analysis (LPA) mixture modeling (Muthén & Asparouhov, 2006; Sterba & Bauer, 2014; Vermunt & Magidson, 2002). Specifically, LPA seeks to identify the smallest number of latent groups that adequately describes the mean profiles of observed continuous variables (here different longitudinal ECI profiles during the educational transition to upper secondary education). A large number of random starting values were used to avoid local maxima and estimation problems (Hipp & Bauer, 2006). We used the following indices to select the number of latent groups in the mixture models: (a) the Bayesian information criterion (BIC) with lower information criterion values indicating a better model fit; (b) the Lo–Mendell–Rubin Adjusted Likelihood Ratio Test (LMR), and the Vuong–Lo–Mendell–Rubin Likelihood Ratio Test (VLMR), which compare solutions with the different number of groups ($p < .05$ indicates that the $k - 1$ group model must be rejected in favor of a model with at least k groups); and (c) the practical usefulness, theoretical justification, and interpretability of the latent groups solution (see Bauer & Curran, 2003; Tolvanen, 2007).

Second, we analyzed whether the profiles of ECI differed regarding the outcomes. The differences between adolescents belonging to different ECI profiles in relation to the outcomes were examined both (a) separately at each time point (indicating synchronous effects) and (b) regarding changes between subsequent time points (indicating effects over time). Synchronous effects were investigated using a 3-step method with the auxiliary command 'DU3STEP' in Mplus (Muthén & Muthén, 1998–2021), whereas to analyze differences between ECI profiles

in changes in outcomes across time, we used the BCH method with latent change score secondary model. In the first step with LPA, we saved BCH weights for further analysis (Muthén & Muthén, 1998–2021). BCH weights reflect the measurement error of the latent class (profile) variable. In the second step, weights were used with latent change scores to estimate the class-specific changes in outcomes. These analyses resemble repeated measures ANOVA analyses in which latent class membership is used as the between-factor. However, in the BCH method, the latent class membership is not fixed, as in ANOVA, but rather measurement error of latent class variable or uncertainty in latent group membership is taken into account.

Third, we examined whether the prevalence of the ECI profiles and their associations with the outcomes differ by gender, testing gender as a predictor and a moderator in the above-described secondary model. Gender differences were explored for the following reasons. First, overall vocational education tracks and occupations in Finland (the study context) are highly segregated by gender (Finnish Institute for Health and Welfare, 2021), implying that, in Finland, gender-sensitive analysis is warranted in all studies focusing on employment-related topics. Second, adolescent girls and boys have been shown to differ in their career expectations and preferences (see, e.g., Hoff et al., 2022; Seiffge-Krenke & Gelhaar, 2008), and this may concern their perceptions of ECI as well. Third, adolescent boys and girls have been found to benefit from different interventions targeted to decrease ECI (Kiuru et al., 2021). We analyzed gender differences using Wald's test, testing group differences in the change scores as well as predicting within-profile change scores.

All statistical analyses were performed using the Mplus statistical package (Version 8.4, Muthén & Muthén, 1998–2021) (see key syntaxes as an Appendix S1). The standard MAR approach (missing at random) was applied, and full-information maximum likelihood estimation was used with non-normality robust standard errors (MLR; Muthén & Muthén, 1998–2021). By using the full information maximum likelihood, we were able to utilize all the data available when estimating the parameters of the models without imputing data. No significant differences in the prevalence of ECI profiles or demographic characteristics were found between adolescents who joined the study after the transition and adolescents who belonged to the T1 cohort (all p -values > .05).

RESULTS

Longitudinal invariance of ECI

In order to test the longitudinal invariance of the scales we estimated a factor model with four factors (separate factors for all four time points) for the ECI scale consisting of five items. Residual covariances of consecutive measurements of the same items were also estimated. Model fit was adequate: $\chi^2(149) = 913.232$, $p < .001$, CFI = 0.917, TLI = 0.894, RMSEA = 0.060, SRMR = .046, supporting configural invariance. When factor loadings of the same items were set equal between different time points, the chi-square difference test was not significant ($\Delta\chi^2(12) = 14.467$, $p = .195$) and Δ CFI (Δ CFI = -0.003) was greater than -0.01 (Cheung & Rensford, 2002) when comparing model without equality constraints thereby also supporting metric invariance.

When the intercept was also set equal between the time points, the chi-square difference test was significant ($\Delta\chi^2(12) = 33.379$, $p < .001$), but Δ CFI (Δ CFI = -0.003) was greater than -0.01 (Cheung & Rensford, 2002) when comparing the model with loadings only set equal between the factors across time points. MacCallum et al. (2006) have proposed an evaluation of small differences between nested structural equation models. In their framework, the null and alternative hypotheses for testing a small difference in fit were defined by some chosen root-mean-square error of approximation (RMSEA) pairs. Based on those RMSEA values, degrees of freedom in both models and sample size, the non-centrality parameter for noncentral chi-square distribution, were determined. The critical value of that non-central chi-square distribution was 498.278 with $\alpha = .05$ and it was greater than the chi-square difference test value, so the model with intercept equality constraints was also supported. Altogether, we may conclude that the ECI scale showed acceptable measurement invariance properties longitudinally.

ECI profiles: Results of LPA

The goodness-of-fit indices of the LPAs for adolescent perceptions of ECI suggested that the three-profile solution fitted the data best (Table 1). The average individual posterior probabilities for being assigned to a specific latent profile in the three-profile model were .83, .74, and .89; the fact that

TABLE 1 Fit indices and class frequencies for latent profile analyses with different numbers of latent profiles ($n = 1413$).

No. of profiles	aBIC	BIC	p Value of LMR	p Value of VLMR
1 ($N = 1413$)	11,939.37	11,964.79		
2 ($n1 = 791$, $n2 = 622$)	11,217.85	11,259.15	<.001	<.001
3 ($n1 = 802$, $n2 = 440$, $n3 = 171$)	10,993.73	11,050.91	<.001	<.001
4 ($n1 = 751$, $n2 = 458$, $n3 = 176$, $n4 = 28$)	10,969.53	11,042.70	.429	.436

NOTE: p -values are <.001 for bold values.

Abbreviations: BIC, Bayesian Information Criterion; LMR, Lo-Mendell-Rubin Adjusted Likelihood Ratio Test; VLMR, Vuong-Lo-Mendell-Rubin Likelihood Ratio Test.

differed between all latent profiles of ECI at T1 ($\chi^2 = 65.80$, $p < .001$). The profile *Low-decreasing ECI before the transition but increasing ECI after the transition* included a higher proportion of boys (62% boys, 38% girls), whereas the profiles *Moderate and decreasing ECI before the transition* (41% boys, 59% girls) and *High and stable ECI during the transition* (24% of boys, 76% girls) included a relatively higher proportion of girls in comparison to boys ($p < .001$). These two girl-dominated profiles showed higher ECI across the measurement points compared to the boy-dominated *Low-decreasing ECI before the transition but increasing ECI after the transition* profile (see [Figure 1](#)). The girls in this study, therefore, experienced more ECI than the boys did.

Next, we analyzed changes in the outcomes within each ECI profile by gender. The results for *life satisfaction* showed that boys in the *High and stable ECI during the transition* profile were more satisfied with their life ($M_{T1} = 3.52$, $M_{T2} = 3.51$, $M_{T3} = 3.63$, and $M_{T4} = 3.60$) than the girls were ($M_{T1} = 2.76$, $M_{T2} = 2.85$, $M_{T3} = 2.85$, and $M_{T4} = 2.93$) in the same profile at each time-point (T1, $p = .003$; T2, $p = .004$; T3, $p < .001$; T4, $p < .001$). However, gender was unrelated to the level of life satisfaction in other profiles. Furthermore, gender did not moderate changes in life satisfaction between the subsequent time-points. The results for *school stress* showed that, compared to boys, adolescent girls reported more school stress after the transition at both T3 and T4 ($p < .001$) in the *Low-decreasing ECI before the transition but increasing ECI after the transition* (girls: $M_{T3} = 2.88$, $M_{T4} = 3.19$; boys: $M_{T3} = 1.97$, $M_{T4} = 2.15$) and *High and stable ECI during the transition* (girls: $M_{T3} = 4.20$, $M_{T4} = 4.36$; boys: $M_{T3} = 3.09$, $M_{T4} = 3.08$) profiles. Thus, higher/increasing ECI is associated with higher school stress among girls than boys. Moreover, compared to boys ($M_{T4} = 2.54$), adolescent girls ($M_{T4} = 3.53$) reported more school stress also at T4 ($p = .005$) in the *Moderate and decreasing ECI before the transition* profile.

Furthermore, gender also moderated the associations between the profiles of ECI and school stress-related changes (Wald test = 20.36, $df = 6$, $p = .0024$). The results of the follow-up analyses revealed that gender was associated with a within-profile change from T2 to T3 in the profiles with *Low-decreasing ECI before the transition but increasing ECI after the transition* ($p < .001$) and in the *High and stable ECI during the transition* ($p = .034$). In these profiles, school stress decreased from ninth-grade spring to the fall of the first year of upper secondary education for boys, whereas school stress either remained the same (*Low-decreasing ECI before the transition but increasing ECI after the transition*) or increased (*High and stable ECI during the transition*) for girls in these insecurity profiles. Finally, gender related to also a within-profile change from fall to spring of the first year of upper secondary studies ($p = .015$) in the *Moderate and decreasing ECI before the transition* profile as school stress after the transition increased among girls but not among boys. Altogether, these findings show that in our sample adolescent girls seemed to suffer more from ECI than boys did, both in terms of experiencing insecurity, but also in terms

of more pronounced reactions regarding life satisfaction and school stress.

DISCUSSION

The objective of this four-wave study was to explore longitudinal profiles of ECI among Finnish adolescents ($n = 1416$) and these profiles' associations with the selected outcomes synchronically and over time. ECI was perceived as a stressor, which was expected to be associated with negative stress outcomes. As far as we know, this study is one of the first to focus on the heterogeneity of the phenomenon of ECI and its different outcomes in adolescence by utilizing several measurement points during a critical educational transition (from comprehensive education to secondary education). A wealth of research evidence on adolescents' different career-related experiences is needed due to the complexity and unpredictability of future working life (see e.g., Khattab et al., 2022). Overall, the present study showed that ECI is a relevant but also a stressful phenomenon in adolescents' lives. Next, we discuss our key findings in more detail and integrate the findings concerning the profiles of ECI and their stress outcomes.

In line with our first hypothesis (H1), the results of person-oriented analyses showed both stability and change in the developmental profiles of ECI among adolescents who encountered their first remarkable career transition during the follow-up period. Specifically, we found three distinguishable longitudinal profiles from the data, signifying that ECI can be a diverse experience among adolescents. One particular profile included adolescents (12% of the sample) who scored high in ECI across the measurement points and can also be called a “*chronic insecurity group*”. Furthermore, adolescents in this subgroup reported many negative stress outcomes (i.e., higher school stress and dropout intentions, and lower life satisfaction) across all the time points. The emergence of this “risky” profile was fully hypothesized (H3) and we also predicted that this “risky” subgroup would report more negative stress outcomes synchronically and/or over time (H5) (see e.g., Kiuru et al., 2021; Klug, 2020; Klug, Bernhard-Oettel, et al., 2019; Lazarus & Folkman, 1984; Taht et al., 2020). Altogether, these findings are consistent with those of different models approaching adolescence as a stressful life stage for many because different developmental tasks, e.g., choosing the right educational track, need to be accomplished during adolescence (e.g., Ferrari et al., 2018; Galambos et al., 2003; Havighurst, 1972; Marcia, 2014; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008). Indeed, adolescence is a life period with many uncertainties and transitions relating, e.g., to future career expectations and employment prospects (Gati & Kulscár, 2021; Hirschi & Koen, 2021; Hoff et al., 2022; Kiuru et al., 2021; Osborn et al., 2013; Sampson et al., 2004), including perceived ECI which we focused on. The findings also support our reasoning that the evidence on adult employees' career/employment insecurity (see e.g., De Witte et al., 2016; Kim & Kim, 2018;

Kinnunen et al., 2014; Klug, 2020) can be extrapolated to adolescents in the sense that insecurity about one's future career prospects can have stressful effects well before young people enter the workforce. Viewing these findings from the perspective of pre-career and stress management interventions, it would be most important to identify and focus on those adolescents who are suffering from long-term ECI as this seems to be a notable stressor in their lives.

However, in line with our hypotheses (H1, H2), we found that ECI was also a *changeable experience* (developing over time) for a vast majority of the adolescents, as 88% of them reported some changes in their level of ECI during the follow-ups. This finding could be integrated into the age-normative educational transition occurring among these young participants. Specifically, we expected (H2) that there would be more ECI before and/or during the educational transition (choosing a secondary educational track) followed by a decrease in ECI after the transition (starting secondary education). Thus, age-normative *developmental tasks*, that is, choosing "right" educational and vocational paths, during adolescence (see e.g., Galambos et al., 2003; Havighurst, 1972; Nurmi, 1993; Seiffge-Krenke & Gelhaar, 2008) was reflected in the respective changes found in the experiences of ECI over time. In our study, the follow-up period covered a crucial pre-career transition from comprehensive education to upper secondary education (i.e., choosing general academic or vocational track).

Specifically, the patterns of changes that emerged in the profiles of ECI were twofold. First, we found a profile where adolescents showed a moderately high ECI across time although with a slight decreasing trend between fall (Time 1) and spring (Time 2) of the ninth grade, that is, the last year of comprehensive education (educational choices regarding upper secondary education were also made between Time 1 and Time 2; *Moderate and decreasing ECI before the transition' profile*). Adolescents (57% of the sample) in this profile also reported negative outcomes more often (e.g., higher school stress and higher dropout intentions, and lower life satisfaction). It should be noted that in this profile, ECI remained also moderately high throughout the follow-up period despite a slight decrease between Time 1 and Time 2. The stable, moderately high level of ECI reported by this profile may partly explain why adolescents belonging to this subgroup also experienced certain negative stress outcomes. This finding shows that also moderately high ECI can be a stressful experience for adolescents and may be associated with detrimental stress-related consequences. Thus, moderately high ECI should also be considered in pre-career and stress management interventions targeted at adolescents in educational transitions.

Second, we also found a profile of adolescents who reported low decreasing but increasing ECI after the transition to upper secondary education (31% of the sample). On the one hand, this profile was unexpected because we had hypothesized that ECI would decrease after the transition to secondary education (H2). On the other hand, increasing ECI after the transition may actually relate to the

educational transition that occurred during the follow-up. Perhaps the adolescents in this subgroup were not entirely satisfied with their educational choice (e.g., they had made a wrong choice) or were worried about their studies or performance (e.g., regarding educational alternatives in the future if not performing well enough), which was then reflected in the experiences of increased ECI. Obviously, the developmental task of choosing the "right" educational track has not been successfully accomplished in this subgroup (Galambos et al., 2003; Havighurst, 1972; Seiffge-Krenke & Gelhaar, 2008), and career counseling interventions might be beneficial for these adolescents. However, it is important to consider that belonging to this profile was not robustly linked with the stress outcomes, and we found only one negative effect in relation to their reports at Time 1. Adolescents in this profile reported a stronger increase in school stress than those in other profiles did after the transition (to upper secondary education), possibly due to increased ECI caused by the transition itself. Nevertheless, adolescents in this profile reported the lowest ECI, school stress, and dropout intentions at each measurement point (compared to other profiles, see Figure 1, Tables 2 and 3). Thus, the level of stressor (ECI) or the school-related negative effects were not the highest at any measurement point in this profile.

Looking at the differences between the profiles in changes over time as a whole, it is noteworthy that while the increase in ECI (Profile 2) was associated with increasing school stress over time, adolescents with decreasing ECI (Profile 1) did not show corresponding improvements in the stress outcomes. This pattern is consistent with the findings obtained among working adults, suggesting that employees do not seem to recover to the same extent or as quickly from reductions in career/employment insecurity as they respond negatively to increasing insecurity (e.g., Klug, Bernhard-Oettel, et al., 2019). This corresponds to temporal models of the stressor-strain relationships which postulate that some stressors can have lingering strain effects even after the stressor is removed (Frese & Zapf, 1988; Garst et al., 2000; see also Klug et al., 2020). However, in contrast, Kinnunen et al. (2014) found that employees' strain declined with decreasing employment insecurity. Inconsistencies in these prior findings may relate to methodological differences (e.g.,

TABLE 2 Estimated latent means of different profiles of early career insecurity (ECI).

Profiles	Profile 1: Moderate and decreasing ECI before the transition (57%, n = 802)	Profile 2: Low-decreasing but increasing ECI after the transition (31%, n = 440)	Profile 3: High and stable ECI (12%, n = 171)
	M (SE)	M (SE)	M (SE)
ECI at T1	2.97 (0.06)	1.99 (0.08)	3.87 (0.11)
ECI at T2	2.78 (0.06)	1.80 (0.07)	3.91 (0.15)
ECI at T3	2.79 (0.08)	1.61 (0.06)	3.96 (0.10)
ECI at T4	2.75 (0.06)	1.80 (0.08)	3.99 (0.12)

TABLE 3 Differences between the early career insecurity (ECI) profiles in the studied outcomes.

	Profile 1: Moderate and decreasing ECI before the transition (57%, <i>n</i> = 802)	Profile 2: Low-decreasing but increasing ECI after the transition (31%, <i>n</i> = 440)	Profile 3: High and stable ECI (12%, <i>n</i> = 171)	Overall test		Pairwise comparisons
	<i>M</i> (<i>SE</i>)	<i>M</i> (<i>SE</i>)	<i>M</i> (<i>SE</i>)	χ^2	<i>p</i>	
Life satisfaction (T1)	3.46 (0.05)	4.10 (0.06)	2.82 (0.12)	128.03	<.001	2 > 1 > 3
Life satisfaction (T2)	3.36 (0.05)	4.06 (0.06)	2.96 (0.11)	108.26	<.001	2 > 1 > 3
Life satisfaction (T3)	3.34 (0.04)	4.16 (0.06)	2.98 (0.09)	167.32	<.001	2 > 1 > 3
Life satisfaction (T4)	3.34 (0.04)	4.07 (0.05)	3.05 (0.04)	157.79	<.001	2 > 1 > 3
School stress (T1)	3.08 (0.05)	2.60 (0.06)	3.63 (0.09)	105.57	<.001	3 > 1 > 2
School stress (T2)	3.20 (0.05)	2.63 (0.06)	3.69 (0.10)	95.10	<.001	3 > 1 > 2
School stress (T3)	2.95 (0.04)	2.29 (0.05)	3.52 (0.10)	170.53	<.001	3 > 1 > 2
School stress (T4)	3.02 (0.04)	2.52 (0.05)	3.61 (0.13)	170.53	<.001	3 > 1 > 2
School satisfaction (T3)	4.05 (0.05)	4.55 (0.03)	3.91 (0.15)	135.59	<.001	2 > 1 > 3
School satisfaction (T4)	4.01 (0.04)	4.50 (0.03)	3.89 (0.12)	114.96	<.001	2 > 1 > 3
Dropout intentions (T3)	1.80 (0.04)	1.37 (0.04)	2.13 (0.09)	55.32	<.001	3 > 1 > 2
Dropout intentions (T4)	1.87 (0.12)	1.56 (0.05)	2.87 (0.46)	58.63	<.001	3 > 1 > 2

in samples, time-lags, or in measurements) across studies, calling for new qualified longitudinal career/employment insecurity studies across the life course covering both adolescence and adulthood. Altogether, the present findings show, for the first time, that career-related insecurity and its negative effects may well concern pre-career stages of adolescence.

Interestingly, our additional analyses suggested that girls might be even more vulnerable than boys are in terms of both accumulating ECI during adolescence and negative reactions. These gender differences may reflect the fact that adolescent girls tend to develop physically and socio-emotionally faster than boys, which may have ramifications for their educational and vocational aspirations and worries related to them (see Kiuru et al., 2021; Seiffge-Krenke & Gelhaar, 2008). Overall, Finnish adolescent girls have reported more school-related stress and burnout than have adolescent boys (e.g., Hirvonen et al., 2019; Parviainen et al., 2020). We propose that these present gender-specific findings should be taken into account in pre- and early-career interventions for adolescents, especially girls, well before they enter the labor market. There is actually already some evidence showing that girls and boys would indeed benefit from different ECI interventions (see also Kiuru et al., 2021). Further research concerning the antecedents of ECI profiles could replicate our findings on gender differences and investigate additional predictors (and moderators) to identify particularly susceptible groups of adolescents and target interventions accordingly.

The present study also has *practical implications*. Interventions focusing particularly on adolescents' career concerns, self-efficacy beliefs, and career decision-making difficulties and anxiety have proven to be effective (see

Koivisto et al., 2011; Li et al., 2022; Osborn et al., 2016, 2020; Rantanen et al., 2019; Vuori et al., 2008). However, we perceive that different formal (system level) and informal measures would work best in reducing ECI and its negative implications in adolescence. First of all, flexibility and instrumental support available in the formal education system may decrease adolescents' ECI. For example, in Finland (see <https://www.infofinland.fi/en/education/the-finnish-education-system>), adolescents can change their educational track quite easily during their secondary education, e.g., moving from the academic (high school) track to the vocational track or vice versa or even accomplish a double degree. Furthermore, in secondary education, each Finnish student will have a personal study curriculum plan worked out together with a career counselor. This plan can also be revised quite easily if needed. All this formal support available in the education system may decrease adolescents' ECI and stress related to potentially "wrong choices" during studies. Furthermore, our findings suggest that it would also be beneficial to increase student counselors' overall awareness of ECI as a stressor during educational transitions to enhance the impact of formal support system.

However, more informal support and arrangements would also be needed to tackle ECI. In this respect, more attention should be paid to measures that improve adolescents' overall career preparedness and self-efficacy (Koivisto et al., 2011). In Finland, an intensive systematic workshop intervention "Towards Working Life" was found to be cost-effective among adolescents transferring to secondary education (see more, Koivisto et al., 2011; Vuori et al., 2008). This systematic pre-career intervention at schools benefited various social learning elements (e.g., participatory group discussions, other small group exercises guided by trained

experts) that had a positive effect on adolescents' career preparedness and self-efficacy. Furthermore, viewed from the perspective of developmental psychology, it would be beneficial to strengthen adolescents' general self-esteem (in interventions and daily activities) because it has been found that adolescents with higher self-esteem suffered less from parental employment insecurity in terms of mental well-being (Mauno et al., 2021). High self-esteem may protect adolescents against ECI experienced by themselves.

It should also be recalled that, in our study, there seemed to be *individual variations* in the perceptions of ECI, shown by different profiles that captured within- and between-variations in ECI over time. Such diversity in ECI deserves also attention in pre-career interventions, e.g., by utilizing a person-centered screening of ECI during early career transitions in adolescence. One very quick, short, and easy-to-administer screening tool for practitioners in this respect is, for example, the Career State Inventory (CSI; Reardon et al., 2020). CSI results can be used to detect those pupils and students who are well prepared for career decision-making and transitions with the regular amount of support from school and parents. It can also help identify those who may need more in-depth group or individual counseling due to, for example, exceptionally high and anxiety evoking career concerns, dysfunctional career thoughts or overwhelming life circumstances hampering career certainty, clarity, and satisfaction. The adolescents belonging to the *High and stable ECI during the transition* profile might very well represent these latter pupils and students in need for intensive support and career counseling already in the fall of the last year in lower secondary education (Time 1 of the present study) or possibly even earlier. Screening adolescents' ECI during educational transitions could also be a cost-effective preventive intervention.

There are few noteworthy *limitations* in our study. First, all data were collected via self-reports, a fact that may cause common method variance bias. Second, some latent profile subgroups were relatively small, and these could be difficult to replicate in future studies. However, one benefit of LPA is its potential also to find non-normative (typically smaller) subgroups in the sample. Sometimes these unexpected subgroups are useful and interesting, for example, regarding interventions and policy recommendations.

Third, even though we utilized longitudinal data with multiple waves, we relied on the assumption that career-related insecurity is a stressor rather than an outcome, a proposition, which has repeatedly been verified in empirical studies among adults (e.g., Cheng & Chan, 2008; De Witte et al., 2016; Sverke et al., 2002, 2019) and which is also consistent with stress theories (e.g., Lazarus & Folkman, 1984). Despite this, the study is limited in its causality assumptions. Consequently, future longitudinal studies are needed for testing a reverse causality hypothesis (i.e., the selected outcomes determine the level of ECI and not vice versa). Fourth, the set of outcomes we included was not complete, for example, overall mental health indicators (e.g., depression, anxiety) were not part of our design.

The final limitation is that our results do not reveal much about the antecedents or buffers of ECI, aside from gender, and future studies should explore more factors that precede ECI and/or buffer against it in adolescents. Such findings might also be beneficial in further developing different early career interventions (see, e.g., Kiuru et al., 2021; Osborn et al., 2020; Rantanen et al., 2019). Finally, looking at the social and policy-level causes of career insecurity across the life course (Gati & Kulscár, 2021; Hayden et al., 2021; Hirschi & Koen, 2021), prevention efforts should also include the policy level to improve access to employment and create quality jobs or traineeships for a more secure and adaptive school-to-work transition (Klug, Drobnič, & Brockmann, 2019; Taht et al., 2020).

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ORCID

Saija Mauno  <https://orcid.org/0000-0002-1161-6578>

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SUPPORTING INFORMATION

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