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Adolescent educational and occupational anxiety: A three-dimensional model to fit into an attachment framework

Pascal Mallet¹ · Emmanuelle Vignoli² · Noëlle Lallemand²

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Abstract

We propose a model of the anxiety adolescents experience about their educational and occupational future that includes three topics they worry about: (a) career failure, (b) parental disappointment, and (c) separation from loved ones to achieve one's career. A total of 16,663 15-year-old French participants filled out a new anxiety questionnaire and other self-reports. Factor analyses showed that all three topics belong to the same type of anxiety, and suggested that the adolescents' fear about their career is closely interwoven with parental attachment. This new kind of anxiety varied across gender and was correlated with school-adjustment and personality variables.

Keywords Adolescents · Career anxiety · Parental attachment

Résumé

Nous proposons un modèle de l'anxiété que les adolescents éprouvent à propos de leur avenir éducatif et professionnel qui inclut trois sujets qui les préoccupent : (a) l'échec de carrière, (b) la déception des parents, et (c) la séparation d'être chers pour réaliser sa carrière. Un total de 16,663 participants français de 15 ans ont rempli un nouveau questionnaire d'anxiété et d'autres auto-rapports. Les analyses factorielles ont montré que les trois sujets appartiennent au même type d'anxiété, et ont suggéré que la peur des adolescents à propos de leur carrière est étroitement liée à l'attachement parental. Ce nouveau type d'anxiété variait selon le sexe et était corrélé avec les variables d'ajustement scolaire et de personnalité.

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Zusammenfassung

Wir schlagen ein Modell der Angst vor, die Jugendliche in Bezug auf ihre Bildungs- und Berufszukunft empfinden, das drei Themen umfasst, die ihnen Sorgen bereiten: (a) berufliches Scheitern, (b) Enttäuschung der Eltern und (c) Trennung von geliebten Menschen, um die eigene Karriere zu verwirklichen. Insgesamt 16.663 15-jährige französische Teilnehmer füllten einen neuen Angstfragebogen und andere Selbstberichte aus. Faktorenanalysen zeigten, dass alle drei Themen zum selben Angststyp gehören und deuteten darauf hin, dass die Angst der Jugendlichen um ihre Karriere eng mit der elterlichen Bindung verknüpft ist. Diese neue Art von Angst variierte je nach Geschlecht und korrelierte mit Schulanpassungs- und Persönlichkeitsvariablen.

Resumen

Proponemos un modelo de la ansiedad que los adolescentes experimentan acerca de su futuro educativo y ocupacional que incluye tres temas que les preocupan: (a) el fracaso profesional, (b) la decepción de los padres, y (c) la separación de los seres queridos para lograr su carrera. Un total de 16,663 participantes franceses de 15 años completaron un nuevo cuestionario de ansiedad y otros autoinformes. Los análisis de factores mostraron que los tres temas pertenecen al mismo tipo de ansiedad, y sugirieron que el miedo de los adolescentes acerca de su carrera está estrechamente entrelazado con el apego parental. Este nuevo tipo de ansiedad varió según el género y se correlacionó con variables de ajuste escolar y de personalidad.

Introduction

Although adolescence is no longer seen as a time of “storm and stress,” emotions play an important role in adolescents’ social adjustment and well-being (Lerner & Steinberg, 2009). For example, their hopes about their future are linked to their optimism, life satisfaction, and career adaptability (Ginevra et al., 2020). As such, this emotion is likely to enhance adolescents’ ability to explore their educational and occupational futures with confidence in their capability to overcome barriers, an ability that lies at the core of the “life designing” paradigm (Savickas et al., 2009). By contrast, adolescent educational and occupational anxiety (AEOA) is an emotion commonly assumed, in the mass media, to negatively affect adolescents. For example, the French newspaper *Le Monde* (2 September 2022) published a front-page article on the pervasive adolescent anxiety assumed to result from vocational choices, and various difficulties in occupational achievement. Accordingly, research has consistently reported the negative effects of career-choice anxiety on the career decision-making process (e.g., Germeijs et al., 2006), and anxiety is a well-documented emotion associated with various adolescent problems, including sleep disturbances (e.g., Pengpid & Peltzer, 2022) and school refusal (e.g., Tekin & Aydin, 2022). Relying on attachment theory and evolutionary psychology, we propose a broader view of AEOA that accounts for the role played by close relationships in this kind of anxiety. To study this emotion, we derived a three-dimensional short-form questionnaire from a longer form that had already been explored by Vignoli

and Mallet (2012). We devised a short form as a means of facilitating the inclusion of such a scale in research packages on adolescent career planning and vocational development, and more generally on other adolescent development and health issues. We reasoned that a valid questionnaire that does not take a lot of time to answer could act as an incentive for scholars and practitioners wanting to take this kind of anxiety into account in their conceptual and theoretical framework. In addition to the dimensionality issue, we examined the nomological network of this new instrument, by focusing on school-related and personality variables that could reveal the negative but also the positive functions of AEOA in adjustment.

Beyond career indecision and decision-making: a broader view of adolescent career anxiety

Because anxiety is an aversive reaction characterized by the fear that something negative might happen (Leary & Kowalski, 1995), it may be elicited in adolescents when they think about their future education and occupation. Indeed a failure in this domain may have detrimental consequences, and adolescents become fully able to understand these consequences by relying on their growing abilities in hypothetico-deductive reasoning (Moshman, 2005). School achievement has long been known in France to have a strong impact on students' future career (e.g., Reuchlin, 1991). Hence, it is not surprising that French adolescents' anxiety about academic failure and about occupational failure has been found to pertain to a single dimension (Mallet, 1999).

Scholars have studied the particular kind of anxiety that youths experience about their career by focusing on choice and indecision. For example, in their Career Factors Inventory, Chartrand et al. (1990) included a career anxiety dimension, which they defined as "the level of reported anxiety that is attached to the process of vocational decision making" [p. 190; for a similar example, see the Emotional and Personality-Related Career Decision-Making Difficulties (EPCD) questionnaire devised by Gati et al., 2012]. Several studies have confirmed the disruptive effect of this career-choice anxiety on the career decision-making process (e.g., Germeijs et al., 2006), and this negative role justifies researchers' interest in this form of anxiety. However, it does not encompass the whole landscape of AEOA, which is interwoven with what Knapp et al. (2022) defined as adolescents' "holistic outlooks on their futures" (p. 1531). This emotional landscape can be framed by Seginer's Future Orientation Model, which has been worded as follows: "Future orientation involves three components: cognitive representations, seen in one's hopes and fears for the future; motivational antecedents that prompt these representations; and behavioral results" (Seginer & Mahajna, 2018, p. 32). AEOA stands as an emotional part of cognitive representations, and this emotional part is sensed by adolescents whenever they think about their educational and occupational future.

From an academic point of view, with the exception of decision-making anxiety, AEOA remains mainly a *terra incognita*. One can nevertheless assume that counselors might provide help to adolescents facing this multifaceted kind of anxiety. Rochat (2018), for example, who relied on functional family therapy, reported an

adolescent case illustration showing that AEOA is not limited to career choice and may be related, among other things, to separation anxiety and parenting.

An evolutionary psychology and attachment theory view of AEOA

Attachment theory was initially theorized by Bowlby (1969) as the need for personal security experienced by infants and children that can be fulfilled only by stable relationships with sensitive partners. The resulting feeling of personal security is a necessary condition for exploring the environment. Bowlby acknowledged that this need is experienced from one's first to one's last breaths. Because parents are still the main security providers for adolescents (e.g., Wilkinson, 2004), any kind of anxiety is likely to stress adolescents' attachment behavior toward them. In addition, AEOA should be triggered by career development in adolescents since the ultimate aim of career development is to increase independence from parents, that is, to distance oneself from one's main security providers.

Attachment theory was elaborated by relying on ethology (for a historical overview, see Hess & Petrovich, 2000). The evolutionary framework can shed light on the emotions involved in adolescent vocational development since preparing for a career during adolescence has major consequences for the ability in adulthood to invest successfully in offspring and pass on one's genes to the next generation. According to Buss (1999), "As a general rule, the evolutionary psychology meta-theory predicts that new adaptive mechanisms will develop or become activated in an individual's life as he or she faces cues to each new adaptive problem—cues that correspond to the adaptive problems our ancestors faced over the course of their development" (p. 388). A problem our ancestors faced during their juvenile years consisted of preparing their behavioral adaptations for the environment they expected to experience during their adult life. This adaptive problem is still relevant today, especially in a historical era characterized by accelerating changes in the world of work (Kenny et al., 2018).

As Miloyan et al. (2019) reminded us, "Darwin (1872) initially proposed that the expression of fear was shaped by natural selection. A century later, Marks (1970) observed that the stimuli and situations that most frequently comprise the objects of fears or phobias seem to bear adaptive significance" (p. 41). From a theoretical point of view, AEOA could enhance what Miloyan et al. coined as "episodic foresight: the capacity to imagine future scenarios and to use these imaginings to guide present action" (p. 40). To a greater extent than other species, humans can anticipate and imagine potential threats, especially in adolescence, because teens become able to accurately foresee their future well in advance (Boyer & Bergstrom, 2011). We propose viewing AEOA as an emotional reaction that channels the elaboration of adult adaptations during the teenage years.

The view of AEOA as adaptive fits well with Inhelder and Piaget's (1955) contention that "formal reasoning" emerges in adolescence as a result of evolutionary selective pressures that favor the cognitive abilities that are useful in foreseeing the world of tomorrow and devising a trajectory toward adult life that contributes to

reforming today's society. Although the Swiss authors did not explicitly mention emotions, their theory of adolescent cognitive development emphasizes the adaptive function of adolescent growth in anticipating and planning abilities that enable foreseeing one's adult future. As part of this developmental process, AEOA is likely to prompt adolescents to prepare their adult career by imagining what their future life could be.

In line with the view of AEOA as adaptive, the emotions of adolescents and parents play a major role in the plans and careers they construct together, for example, through the role played by shared emotional states in their discussions about their career (Young et al., 1997). Furthermore, the quality of adolescents' attachment to parents has been found to play a positive role in career exploration and adjustment to career transitions (Schultheiss, 2003). Therefore, AEOA could enhance vocational-identity development (exploring, committing to, and reconsidering career alternatives) by boosting parent-adolescent discussions, which are known to contribute to the co-construction of a common view of adolescent career goals (Otto, 2000).

A three-dimensional model of anxiety in mid-adolescence

Although educational and occupational anxiety in mid-adolescence can be assumed to consist of a holistic concern about distant adult life, we suggest that this general landscape is the background against which adolescents become aware of some more clearly identified topics to worry about at the present time. In an exploratory study using an open-ended questionnaire, Gantelet (2000) asked 15-year-old students about the fears and worries they might experience when imagining their educational and occupational future. Their content analysis revealed three main domains: (a) failing in one's educational and occupational future, (b) disappointing parents because of one's educational and occupational future, and (c) being forced to move away from family and friends to pursue one's career.

Regarding the first domain, adolescents mentioned worrying about failure following poor academic performance, the lack of access to good standard curricula, being forced to accept any job that would earn one one's livelihood, and so on. The second domain consists of worries about disappointing parents due to poor career achievement. This domain can be seen as pertaining to attachment feelings, insofar as the fear of not meeting parents' expectations could correspond to worrying about not being worthy of their love. This contention is consistent with the finding obtained by Tazouti et al. (2018), who reported that the intensity of parents' anxiety about their children's academic success was positively correlated to their children's own anxiety about their academic success. Another empirical finding supporting the strong connection between the emotions of the parents and those of their adolescent was reported by Bourret et al. (2023). Relying on direct observation of parent-adolescent dyadic interactions, including an analysis of the facial expression of emotions, they found that parents influence their adolescent's vocational development through the dynamic interplay between their emotions during career-related conversations. We suggest that this emotional contagion goes beyond the context of conversations, and we hypothesized that the intensity of adolescents' fear of failure is positively

correlated with the intensity of their fear of disappointing parents, resulting from the fact that they anticipate their parents' emotions.

The third domain pertains to separation anxiety. Only a minority of adolescents suffer from intense separation anxiety, with the overwhelming majority experiencing slight-to-moderate separation anxiety (Eisen & Schaefer, 2005). As mentioned above, ordinary separation anxiety is likely to be triggered by thinking about one's future career because career achievement is a main avenue toward increasing one's independence from parents.

The fact that two of these domains emphasize close relationships supports our assumption that career anxiety in mid-adolescence and attachment relationships are interdependent. We see these three kinds of anxiety as expressing the same worrying uncertainty about one's ability to ensure future personal security when independent from parents. This three-dimensional model received initial empirical support in a study that relied on a long-form questionnaire, filled out by a small sample of French 15-year-olds (Vignoli & Mallet, 2012). In that study, an exploratory factor analysis yielded a hierarchical model comprising three first-order factors (i.e., the three aforementioned dimensions) and one second-order factor.

Exploration of the nomological network in the fields of school adjustment and personality

First, we chose a kind of anxiety that could be assumed to be moderately close to the new construct, namely academic learning anxiety. Worrying about succeeding on upcoming school tests is similar to anxiety about one's educational career, but it is more concrete and focuses on the present time. To further analyze school-related individual characteristics that could be related to AEOA, we hypothesized that fear of failure and fear of parental disappointment would be positively correlated with school achievement motivation because worrying about one's career can be assumed to reveal that one recognizes the importance of being successful in school. However, there was no reason to expect such a relationship for fear of separation from loved ones. Since a low level of academic performance sends out an unequivocal signal about upcoming career difficulties, and it is closely linked to adolescents' self-perceived academic skills (e.g., Harter, 1999), we hypothesized that grade point average (GPA) and self-perceived academic skills would be negatively correlated to fear of failure and fear of parental disappointment.

In line with this hypothesis, we expected global self-esteem to be negatively correlated with AEOA, because this type of anxiety should instill pervasive self-doubt over the years. It should also foster the fear of negative evaluation by peers, since peers are aware of how well or poorly each student does in school. These hypothesized links could result from feedback effects on AEOA of low self-esteem and a strong fear of negative evaluation by peers.

To further examine the difficulties likely to be associated with a high degree of AEOA, we focused on impulsiveness. Since anxiety is associated with an attentional bias for focusing on the threatening information that feeds a particular anxiety (Öhman & Mineka, 2001), an intense concern about one's career could also disrupt

adolescents' adjustment, by way of a lack of attention to the consequences of ordinary behavior, as though too much of their anticipation abilities were absorbed by an obsession with their career. Accordingly, we hypothesized that career anxiety would be positively correlated with Eysenck and Eysenck's (1977) narrow impulsiveness (ImpN) dimension of personality, which is the tendency to act without thinking.

The present study

The present study was aimed at providing empirical support for a three-dimensional model of AEOA viewed as interwoven with attachment to parents. We devised a short-form questionnaire enabling an easy and reliable assessment of these three dimensions. According to our hypothesis, these dimensions are partially separate from each other while sharing a part of the same general career-anxiety component. We tested a nationally representative sample of 15-year-old French students and then conducted a series of exploratory and confirmatory factor analyses. In addition to reliability analyses, we tested specific hypotheses about the correlations between the three AEOA dimensions and the school-adjustment and personality variables.

Method

Participants

The participants were 16,663 students (52.66% girls) with a mean age of 15 years and 4 months [standard deviation (SD) = 7 months] whose native language was French. All were in their fourth year of secondary school, at the end of which students are channeled into different curricula. The students were part of a larger study (i.e., including other questionnaires about various issues such as well-being and peer relationships) carried out by the French Ministry of Education as a tool to monitor students' social adjustment and to provide guidelines for educational policy.

Procedure

The participants were randomly chosen from schools that were also randomly chosen from each school district in France. Informed consent was obtained prior to data collection, which took place in the classroom. The survey was approved by the Research Ethics Board of the National Ministry of Education. Students were assured of the confidentiality of their answers. As a consequence of logistical constraints, GPA was obtained for only 8078 participants, who did not differ significantly from other participants on any of the other variables in the study.

Data analysis

The purpose of Phase 1 was to examine the factor structure of the AEOA short-form questionnaire. We used an exploratory factor analysis (EFA) to describe the dimensionality of the instrument and the internal consistency of the scale and subscales. The Kaiser–Meyer–Olkin measure of sample adequacy was 0.84, suggesting suitability for factor analysis.

In Phase 2 we compared the fit of four theoretical models of AEOA via confirmatory factor analyses (CFA), and we assessed the reliability of the scale. We tested and compared four CFA models to investigate the structure underpinning AEOA: (a) a unidimensional model with a single factor containing all items, (b) a three-factor correlational model (i.e., the three hypothesized factors correlated with each other), (c) a three-factor model with each item loading on one of three first-order factors not related to each other but regressed to a higher-order AEOA factor, and (d) a bifactor model with each item loading onto one of the three specific factors and onto a general AEOA factor. The theoretical framework we designed above aligned the best with the fourth model.

On the basis of the guidelines of structural equation modeling (Hooper et al., 2008; Hu & Bentler, 1999; Kline, 1998), several fit indices were examined: chi-squared (χ^2), the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). In Table 2 we reported the fit indices of the alternative measurement models. The Bayes information criterion (BIC), which penalizes badness of fit and model complexity, was also calculated (Arbuckle, 2014). Before running CFA, univariate and multivariate distribution indices were examined. The skewness and kurtosis values were less than 1, suggesting a normal distribution (Weston & Gore, 2006), and there were no high inter-item correlations ($r \geq 0.80$). Accordingly we kept all 12 items to run the analyses. We devoted Phase 3 to the nomological network of the questionnaire.

The data were analyzed using SAS 9.4. Structural equation modeling (SEM) was done in IBM SPSS Amos 27.0 (Arbuckle, 2014). To perform the EFA and CFAs on two samples, two groups were randomly selected. To explore the factor structure (Phase 1), a small sample representing 6.25% ($N = 1041$) of the 16,663 participants was randomly extracted. The CFAs and other analyses (Phase 2) were based on the remaining sample of 15,622 participants. There was no significant difference between the two samples in regard to any of the variables.

Measures

Adolescent educational and occupational anxiety (AEOA)

The AEOA short-form questionnaire was derived from the original 29-item scale (Vignoli & Mallet, 2012). We decided to construct this short-form questionnaire to encourage scholars to include this measure in their research packages. The 12 items

we kept (four per dimension) for the short form were chosen on the basis of two criteria: (a) strong saturation on the factor to which the item belonged, and (b) moderate redundancy with the other items of the same subscale. Table 1 presents the 12 items.

Academic learning anxiety

We used Demangeon's (1966) five-item French scale, which assesses worrying about not understanding courses, being unable to give right answers in class, and being unsuccessful on academic tests. A translated sample item is "When I am learning a lesson, I am afraid of not knowing the answers when tested." In the present study, Cronbach's alpha was 0.72.

Self-perception of academic skills

The participants' perceived academic skills were evaluated on the basis of a four-item French scale. This measure is quite similar to the academic-self-esteem measure in Harter's Self-Perception Profile for Adolescents (Harter, 1999). A translated example is "I am one of the best students in my class." Cronbach's alpha was 0.89.

School achievement motivation

We used six items taken from the French scale devised by Forner (1989). The items tap the extent to which students are interested in academic domains and ready to spend time and invest effort in schoolwork. We selected the items that would avoid redundancy. A translated example is "I am very interested in everything we study in school." Cronbach's alpha was 0.80.

Global self-esteem

We selected 5 of the 10 items on Bourcet's (1994) French version of the Rosenberg Self-Esteem Scale (1965) while paying attention to content diversity. An example is "On the whole, I am satisfied with myself." Cronbach's alpha was 0.74.

Fear of negative evaluation by peers

We assessed this personality dimension using four items taken from the fear of negative evaluation subscale of La Greca and Lopez's (1998) Social Anxiety Scale for Adolescents. An example is "I worry about what other students think of me." Cronbach's alpha was 0.92.

Impulsiveness

This scale was adapted from Eysenck and Eysenck's (1977) narrow impulsiveness scale (ImpN), which attempts to tap the propensity to act without thinking. We

Table 1 Results of the exploratory factor analysis (Phase 1) for the 12-item adolescent educational and occupational anxiety scale (N = 1041)

Items	Factor loading		
	Fear of failure	Fear of parental disappointment	Fear of separation from loved ones
1. I often wonder whether I will succeed in my studies./Je me demande souvent si je réussirai mes études.	0.62	0.05	0.01
5. I am constantly thinking about my educational and occupational future./Je pense sans cesse à mon avenir scolaire et professionnel.	0.55	-0.01	-0.04
8. When I think about my future occupation, I am worried about what life will bring me./Quand je pense à ma profession future, je suis inquiet/inquiète de savoir ce que me réserve la vie.	0.75	0.00	0.02
11. I'm afraid I won't find a job when I graduate./J'ai peur de ne pas trouver d'emploi à la fin de mes études.	0.42	0.18	0.06
2. I am afraid that my academic and occupational future will not meet my parents' expectation./J'ai peur que mon avenir scolaire et professionnel ne soit pas à la hauteur de ce que mes parents attendent.	0.17	0.62	0.06
4. I worry that my parents will think less of me if I don't do as well in school as they hope./Je crains que mes parents aient une moins bonne opinion de moi si je ne réussis pas aussi bien mes études qu'ils le souhaitent.	0.00	0.80	0.04
7. I am afraid that my parents will be disappointed if I achieve only a low level of educational and occupational training./J'ai peur que mes parents soient déçus si je n'atteins plus tard qu'un niveau de formation scolaire et professionnelle peu élevé.	-0.07	0.82	0.02
10. I fear that in the future my parents will regret that I did not get a better education./Je crains que dans le futur mes parents regrettent que je n'aie pas fait de meilleures études.	0.06	0.74	0.02
03. Having to move away from my loved ones for my studies or work is something that worries me./Etre contraint(e) de m'installer loin de celles et ceux qui me sont chers pour continuer mes études ou pour trouver du travail est quelque chose qui me préoccupe.	-0.05	0.08	0.53
6. I fear that my studies will take me away from my friends./Je crains que mes études m'éloignent de mes amis.	0.02	0.01	0.52
9. I fear that my future occupation will take me away from my family./Je crains que ma future activité professionnelle m'éloigne de ma famille.	0.01	-0.04	0.81
12. I am afraid of being separated from my family to study./Je crains d'être séparé(e) de ma famille pour faire mes études.	0.01	-0.02	0.80
Percentage (%) variance explained by each factor eliminating other factors	16.50%	26.40%	26.60%

Table 1 (continued)

Items	Factor loading	
	Fear of failure	Fear of separation from loved ones
	45.50%	40.90%
	54.10%	

Percentage (%) variance explained by each factor ignoring other factors

The item number refers to its order in the scale

retained four quite diversified items. An example is “I often get into a jam because I do things without thinking.” Cronbach’s alpha was 0.77.

GPA

We obtained the GPAs of 8078 participants. In France, GPA is the average of grades in mathematics, French, natural science, geography, and history. The scores ranged between 0 and 20.

The participants filled out the questionnaires on a five-point Likert scale ranging from 1 (Does not describe me at all) to 5 (Definitely describes me). When the items were adapted from English (“Fear of negative evaluation by peers” and “Impulsiveness”), we followed the International Test Commission’s Guidelines (Jeanrie & Bertrand, 1999). The French version was translated back into English by a native English speaker. The two judges who assessed the conceptual similarity between the original and back-translated items were native English speakers and had an academic background in psychology, and both judged the two versions of each item to be “identical” (i.e., using the Jeanrie and Bertrand’s four-point scale).

Results

Phase 1: exploration of the factor structure

In accordance with our hypothesized three-dimensional model, we performed a three-factor analysis with oblique oblimin rotation on the 1041 participants and the 12 items of the AEOA questionnaire (Table 1). The three factors accounted for 69.5% of the total variance. All items had the highest loading (above 0.44) on the expected factor. The four fear-of-failure items accounted for 16.50% of the variance, the four fear-of-parental-disappointment items 26.40%, and the four fear-of-separation-from-loved-ones items 26.6%. Cronbach’s alphas were 0.73, 0.86, and 0.76 for the fear-of-failure, fear-of-parental-disappointment, and fear-of-separation-from-loved-ones subscales, respectively, and 0.83 for the total scale.

Phase 2: confirmatory factor analysis of four models

The results suggested that the one-factor model did not fit the data well. All the fit indices were well below the required standard: chi-squared was very high, CFI and TLI were well below the 0.90 threshold, and RMSEA and SRMR were well above 0.06 and 0.08, respectively.

For the three-factor correlational model and the higher-order model, the fit indices were identical and acceptable: TLI and CFI were clearly above 0.90, RMSEA was acceptable, and SRMR was far below 0.08. Regarding the three-factor correlation model, each item obtained its highest loading (above 0.47) on its respective factor. With respect to the higher-order model, the three first-order factors regressed onto a general second-order factor. All items loaded onto their

respective first-order factor at above 0.47. The fear-of-parental-disappointment and fear-of-separation-from-loved-ones factors loaded highly on the second-order factor (0.65 and 0.43, respectively), but the fear-of-failure factor obtained the highest loading (0.92).

The bifactor model resulted in a loading of each item onto both a general factor and a group factor corresponding to its specific subscale. The four fear-of-failure items had their highest loading on the general factor. Conversely, the four fear-of-parental-disappointment items and the four fear-of-separation-from-loved-ones items had the highest loading on their respective group factors. All 12 items loaded significantly and above 0.28 onto the general factor. Whenever the explained common variance (ECV) is above 0.70, a scale can be considered unidimensional (Rodriguez et al., 2016). In our study, ECV was 0.45%.

According to the structural equation modeling guidelines, the bifactor model fit better than the three-factor correlational and higher-order factor models (Table 2). CFI and TLI were better in this model (above 0.95). The change in CFI and TLI was greater than 0.01 ($\Delta\text{CFI} = +0.02$, $\Delta\text{TLI} = +0.02$), indicating a difference from previous models and an improved fit (Cheung & Rensvold, 2002). Among the four models, the bifactor one obtained the lowest BIC and RMSEA. As for the three-factor correlational model and the higher-order model, SRMR was clearly low. We concluded that the bifactor model fit the data the best.

Next, we calculated other bifactor indices. Whenever the omega H (ωH) coefficient is above 0.80, the total score can be considered unidimensional, and the omega Hs (ωHs) coefficients reflect the proportions of reliable variance of the subscales (Reise, et al., 2013). In our sample, ωH was 0.64 for the general score, and the ωHs were 0.11, 0.51, and 0.60 for fear of failure, fear of parental disappointment, and fear of separation from loved ones, respectively. Finally, the omega coefficients (ω), which are factor-analytic, model-based estimates of reliability (Rodriguez et al., 2016), were computed for the general and group factors. These coefficients were high and indicated good consistency of the scale and subscales: $\omega = 0.88$ for the total AEOA score, $\omega\text{S} = 0.76$ for fear of failure, $\omega\text{S} = 0.86$ for fear of parental disappointment, and $\omega\text{S} = 0.77$ for fear of separation from loved ones.

Table 2 Goodness-of-fit statistic for the four confirmatory factor analyses (Phase 2) for the 12-item adolescent educational and occupational anxiety scale ($N = 15,622$)

Model	χ^2	Df	CFI	TLI	RMSEA	90% CI of RMSEA	SRMR	BIC
M1: 1-factor model	24,602.64*	54	0.63	0.55	0.17	[0.17, 0.17]	0.12	24,834.39
M2: 3-factor correlated model	2873.97*	51	0.95	0.94	0.06	[0.06, 0.06]	0.04	3134.70
M3: higher-order model	2873.97*	51	0.95	0.94	0.06	[0.06, 0.06]	0.04	3134.70
M4: bifactor model	1861.19*	42	0.97	0.96	0.05	[0.05, 0.06]	0.03	2208.82

Statistics are based on maximum likelihood estimation. CFI comparative fit index, RMSEA root mean square error of approximation, CI confidence interval

* $p < 0.001$

Phase 3: descriptive analyses of AEOA scores and exploration of the nomological network

The skewness for the total scale and its subscales was nearly zero or moderate, ranging from -0.08 to 0.32 , for fear of failure and fear of separation from loved ones, respectively. The means and standard deviations for the total scale and its subscales are presented in Table 3. Overall the observed means were close to the arithmetic mean, with the exception of fear of failure, whose mean was significantly higher than those of fear of parental disappointment ($t = 49.72$, partial $\eta^2 = 0.9$; $p < 0.001$) and fear of separation from loved ones ($t = 54.08$, partial $\eta^2 = 0.94$; $p < 0.001$).

In line with our exploratory and confirmatory analyses, the three subscales were positively intercorrelated, with the strongest correlation being between fear of failure and fear of parental disappointment. Among the three subscales, fear of failure was the most strongly correlated with total AEOA (Table 4). These correlational results are consistent with our factor analyses and confirm those obtained in Phase 1.

Girls scored significantly higher than did boys on the total AEOA and on the three subscales (Table 3). According to Cohen's social science standards (Cohen, 1988), the effect size was moderate for fear of failure ($d = 0.39$), small for total AEOA ($d = 0.24$) and fear of separation from loved ones ($d = 0.17$), and minuscule although significant for fear of parental disappointment.

The correlations between the AEOA scores and the other measures are presented in Table 4. In accordance with our hypothesis, academic learning anxiety exhibited a positive and high correlation with total AEOA ($r = 0.49$) and moderate-to-high correlations with the three subscales (r s ranged from 0.27 to 0.49). Contrary to our expectations, GPA, which was collected for a portion of the participants, had small-to-moderate negative correlations with total AEOA, fear of failure, and fear of parental disappointment (r s = -0.15 , > -0.12 , and > -0.23 , respectively). Consistent with this unexpected result, self-perception of academic skills, which had a high positive correlation with GPA ($r = 0.71$; $p < 0.001$), obtained a negative, small-to-moderate negative correlation with total AEOA, fear of failure, and fear of parental disappointment (r s = -0.15 , -0.11 , and -0.21 , respectively). However, as hypothesized, school achievement motivation had small, positive correlations with total AEOA and fear of failure (r s = 0.14 and 0.20 , respectively).

We expected AEOA to negatively impact global self-esteem, and we indeed observed a negative although small-to-medium correlation between self-esteem and

Table 3 Means and standard deviations of the adolescent educational and occupational anxiety subscales and total scale for boys and girls for the Phase 3 ($N = 15,622$)

	Fear of failure	Fear of parental disappointment	Fear of separation from loved ones	Total scale
Boys	3.10 (0.95)	2.72 (1.14)	2.65 (1.01)	2.82 (0.78)
Girls	3.47 (0.94)	2.75 (1.25)	2.82 (1.06)	3.01 (0.81)
Total	3.29 (0.94)	2.74 (1.18)	2.74 (1.02)	2.92 (0.79)

Table 4 Correlations between adolescent educational and occupational anxiety subscales, the total scale, and other scales on the Phase 3 ($N = 15,622$)

	1	2	3	4	5	6	7	8	9
1. Fear of failure									
2. Fear of parental disappointment	0.49								
3. Fear of separation from loved ones	0.32	0.25							
4. Total AEOA	0.78	0.80	0.68						
5. Fear of negative evaluation by peers	0.33	0.25	0.27	0.37					
6. Academic learning anxiety	0.49	0.36	0.27	0.49	0.30				
7. Global self-esteem	-0.17	-0.23	-0.01	-0.19	-0.18	-0.22			
8. Self-perception of academic skills	-0.14	-0.26	0.02	-0.18	0.05	-0.28	0.43		
9. School achievement motivation	0.20	0.05	0.07	0.14	0.08	0.15	0.09	0.27	
10. Impulsiveness	0.26	0.32	0.16	0.33	0.23	0.25	-0.12	-0.24	-0.18

All correlations are below the 0.0001 significance level

total AEOA, fear of failure, and fear of parental disappointment ($r_s = -0.19, -0.17,$ and -0.23 , respectively). With respect to fear of negative evaluation by peers, the correlations with total AEOA and the subscales were all positive and moderate (r_s for the subscales and total AEOA ranged from 0.25 to 0.37). As expected AEOA exhibited medium-sized, positive correlations with impulsiveness (r_s for the subscales and total AEOA ranged from 0.16 to 0.33).

Discussion

An attachment theory approach to adolescent career anxiety

We set out to validate a short scale designed to assess the anxiety adolescents experience when they think about their educational and occupational future. The scale operationalized a model of AEOA as a worrying backdrop against which three more specific and interrelated worries stand out. In line with an initial EFA, a series of four CFAs on a separate sample of 15-year-olds validated the factor structure. It showed that the bifactor model was optimal, and yielded a general career-anxiety factor and three specific factors. In particular, each item in the bifactor model loaded onto one of the three specific factors and onto a general AEOA factor. The fact that the highest loading was onto the general factor for all four fear-of-failure items and on their respective specific factors for the other two subscales suggests that fear of failure lies at the core of this anxiety. Overall the results showed that the three specific factors shared a significant

part of the same emotional component, although the scale was clearly not unidimensional. The CFA model-based estimates confirmed that the subscales and total scale had satisfactory reliability levels.

In accordance with Seginer's Future Orientation Model (Seginer & Mahajna, 2018), we propose that AEOA be viewed as an emotional part of adolescents' cognitive representations of their future. Counselors may find helpful to have better knowledge of this emotional component, which is connected to adolescents' vocational behavior and may motivate their request for consultation (Rochat 2018). We included all three specific kinds of anxiety in an attachment theory framework: (a) not being able to succeed in one's career means not gaining access to adult autonomy, (b) disappointing parents by underachievement in one's career means deviating from expectations of one's main attachment partners, and (c) having to leave loved ones for career purposes means not being self-reliant when one is far away from current emotional-support providers.

Sex differences

The girls' higher scores on the AEOA variables are consistent with the anxiety research (for a review, see McLean & Anderson, 2009). This difference is not always found, however. For university students, some studies have reported that women scored slightly higher than men on anxiety associated with career decision-making (e.g., Gati et al., 2012), but others did not observe such a sex difference (e.g., Saka et al., 2008). In a sample of Turkish high school students, Öztemel (2014) found that girls reported slightly more anxiety about career decision-making than did boys, but the author acknowledged that previous research is scarce and inconsistent.

In our study, the size effect varied across subscales. The largest difference, which was in fear of failure, suggests that girls are more concerned than boys about threats to their career. According to our evolutionary psychology approach, this higher anxiety could explain why, compared with boys, girls invest more effort and spend more time making career decisions, and are more likely to consult others before choosing a career, as Ginevra et al. (2012) found in a sample of Italian adolescents. Regarding fear of parental disappointment, which could strengthen the fear of being less worthy of parental love, the sex effect was trivial. According to Bowlby's (1969) theory, this kind of attachment worrying is similar for the two sexes, a statement that has been supported by empirical studies on adolescent attachment to parents (e.g., Wilkinson, 2004). The higher mean score we obtained for girls compared with boys for fear of separation from loved ones is consistent with previous research on adolescent separation anxiety. In Potard et al.'s (2020) study, for example, adolescent girls scored higher than boys on a separation anxiety symptom inventory, especially on the dimension "Distress at being away from a secure base." In sum, the sex differences we observed fit well with an attachment theory view of AEOA since they are consistent with previous research on adolescent attachment to and separation from parents.

Nomological network

The large, positive correlation we observed with academic learning anxiety suggests that AEOA is close to anxiety about immediate and concrete aspects of one's educational career in addition to more abstract and future-oriented aspects of one's career in general. AEOA was negatively correlated here with GPA and self-perception of academic skills. This was especially true for fear of parental disappointment. Since this finding is in line with previous reports on the negative correlation between career decision-making anxiety and feelings of competence (e.g., Daniels et al. 2011), it suggests that the negative effect of career anxiety on academic skills is not specific to worrying about career decision-making. Nevertheless, in line with our hypothesis, school achievement motivation was positively correlated with fear of failure. In summary, fear of failure can be seen as indicating an incentive to do schoolwork, whereas fear of parental disappointment can be seen as reflecting a realistic awareness of low academic abilities.

The AEOA total scale, fear of failure, and fear of parental disappointment were moderately and negatively correlated with self-esteem, a result which is consistent with our hypothesis that worrying intensely about one's potential career difficulties may be detrimental to a teenager's sense of self-worth. Similarly, our results for fear of negative evaluation by peers supported our hypothesis that AEOA strengthens the negative judgments adolescents expect from peers. Finally, the positive link we observed between AEOA and impulsiveness suggested that being highly concerned with one's future career could reduce attention skills in everyday life, an interpretation that does not preclude a reverse effect.

General discussion and practical implications for counseling

Our work contributes to a body of literature exploring the ways in which adolescents deal with their future orientation. To this end we examined three of the topics they worry about during mid-adolescence. Relying on an evolutionary framework (Miloyan et al., 2019), we assumed that it might be an adaptive, cognitive-emotional reaction that prompts adolescents to forecast and prepare their adult career as interwoven with other adult life areas. The only result that fits well with this view is that fear of failure was correlated to school achievement motivation. The AEOA subscales were negatively correlated to school performance, self-perception of academic skills, and global self-esteem, and positively correlated with impulsiveness and fear of negative evaluation by peers. This pattern does not support the view that AEOA is a factor of career development, social adjustment, and well-being.

However, to be adaptive in our environment, the behaviors rooted in our phylogenetic history—because they were adaptive at a given time to a given environment—may require certain circumstances (Buss, 1999). Insofar as our results, especially the positive correlation of fear of failure with fear of parental disappointment and fear of separation from loved ones, underline the relational dimension of adolescent career anxiety, we suggest that it is adaptive only if the interpersonal context provides personal security. More specifically, AEOA seems

likely to trigger the parental attachment system, and the quality of that attachment could make some specific forms of AEOA either impede or enhance adolescent career development and vocational maturity. In line with this contention, Vignoli et al. (2020) showed that adolescent sharing with parents about career issues is a reliable means of obtaining reassurance, emotional security, reduced feelings of loneliness, and a stronger feeling of being able to cope with career challenges. Consistently, Ginevra et al. (2020) observed that 11- to 15-year-old adolescents' perceptions of parental support indirectly predicted career choice through the mediating effect of career self-efficacy, a finding that underlines the importance, in vocational processes, of individual differences in the parent–adolescent relationship.

In their observational study, Bourret et al. (2023) found that, during their discussions about career, adolescents and parents expressed more negative emotions than positive ones, thereby confirming that this is an emotionally difficult issue. Although they reported that, as a whole, parents behaved in a more autonomy-supportive way than in a controlling way, previous research and our results suggest that not all parent–adolescent dyads are equal with respect to coping with this emotional challenge, which depends on the adolescent's career anxiety and the quality of parental attachment. It therefore seems crucial for counselors to be aware of these socioemotional dyadic characteristics so that they can provide dyads that suffer from a mixture of an adolescent's high AEOA level and anxious parental attachment with guidance that is especially oriented toward establishing an emotionally secure climate.

These results call for a counseling approach to adolescent career anxiety that includes the key issue of relationships with parents. Taking into account the major dimensions of adolescents' anxiety about their career could enrich an approach to career counseling that “incorporates relational factors into the assessment, conceptualization, and intervention phases of career counseling” (Schultheiss, 2003, p. 305). An enlarged focus on career-related emotions perceived by adolescents could shed additional light on the variables mediating the interplay between family relationships and career behavior (i.e., decision-making, planning skills, etc.), as advocated by Schultheiss (2008, p. 16), an avenue that was successfully explored by Lo Cascio et al. (2013). Such an enrichment of career counseling practices would be especially welcome today since, as noted by Kenny et al. (2018), “transformations in the world of work associated with high levels of uncertainty, anxiety, and unstable work are exerting profound effects on the relational lives of individuals and those close to them” (p. 136).

Limitations and conclusion

A first limitation of our study concerns the factorial structure's gender and age invariance, which should be addressed in future research by recruiting a new sample of participants that covers a broader age range. Although in addition to the EFA and CFA reported above, we carried out the same analyses separately for boys and girls and found the same overall structure—suggesting that boys and girls conceptualize AEOA in the same way—a factorial structure's gender-invariance analysis in due form (Little, 1997) would be a significant advancement. The measurement

invariance could also be measured across countries with different educational organizations and job markets. Such an investigation could discover significant new AEOA dimensions that characterize specific cultures.

From a developmental standpoint, it would be useful for counselors to have documentation on the normative development of AEOA between childhood and adulthood. Above all, the most helpful improvement for practitioners, including school counselors and psychologists, would be to use longitudinal data as a means of gaining insight into the conditions under which a high AEOA level predicts maladjustment behaviors such as school dropout or school burnout.

We did not assess decision-making anxiety. Further research could try to fill in the gap between this kind of anxiety (e.g., Gati et al., 2012) and the more holistic, multidimensional anxiety that was the focus of our study. What might be the interplay between these two forms of career anxiety? Another limitation stems from our sole focus on anxiety, which should be examined together with other emotions elicited by one's educational and occupational future, including hope for one's future (Ginevra et al., 2020). This could improve our knowledge of their respective hypothetical and interactional effects on vocational development. Our picture of the entire emotional landscape of adolescent "life designing" (Savickas et al., 2009) is still in an early stage.

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