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Who gets promoted to the top? Nuanced personality and psychosocial trait differences in highly structured work environments: Evidence from German professional female athletes

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Who gets promoted to the top? Nuanced personality and psychosocial trait differences in highly structured work environments: Evidence from German professional female athletes

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Despite a solid foundation of women's career progression research, the role of personality and psychosocial characteristics in explaining objective career success is not yet fully understood. Structural underrepresentation of female executives at board levels remains an issue in both Europe in general and Germany in particular. Today, two alternative perspectives on the role of gender and personality in career advancement prevail. On the one hand, the *gender-invariant role demands perspective* suggests that women in executive positions show agentic personality traits, whereas advocates of the *changing leadership roles perspective* argue in the opposite direction, emphasizing the benefits of distinct communal traits in today's changing environment. Analyzing data from 299 German athletes from different sports contexts, 159 of which are female, we investigated the unsolved labor market success puzzle of which personality, psychosocial, and cognitive characteristics are rewarded at the very top of the labor market pyramid for females versus males. Our results provide further support for the *gender-invariant role demands perspective* as the female athletes who made it to the highest possible ranks do not show many clearly distinguished attributes from their male peers, despite high core self-evaluation (CSES) scores, i.e., rather agentic traits like internal locus of control, self-esteem, and self-efficacy. Using survival analysis, we also find support for the *gender-invariant role demands perspective* in explaining the relative *speed* of male and female athletes' promotions to top positions. As our results are derived from within-sex competition, i.e., women compete with women, while men compete with men for the top ranked spots, it is particularly noteworthy that even in such settings the *gender-invariant role demands perspective* prevails. This implies that the numerous efforts of organizations to encourage women's career progression in recent years need to start addressing leadership requirement perceptions at the core to plant the seed for increased probability of women reaching top executive positions.

Keywords: CAAS; CSES; objective career success; personality traits; promotion

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Who gets promoted to the top?

Nuanced personality and psychosocial trait differences in highly structured work environments: Evidence from German professional female athletes

1. Introduction

In recent years, corporate leadership teams around the world have substantially increased their efforts to help women ascend into leadership positions (Kossek & Buzzanell, 2018; Ely, Ibarra, & Kolb, 2011; Hillmann, Shropshire, & Cannella, 2007). For example, German Telekom's top-management development programs demand that at least 30% of the candidates are female (Voßkühler, 2018). Somewhat similarly, the German Commerzbank introduced a dedicated female mentoring program as well as career days for women (Groll, 2015). Leading global investment bank Goldman Sachs even announced that companies with all-male boards should not be listed on the stock market (McEnery, 2020). In the same vein, German government officials agreed on a law ensuring a quota for women on boards with more than three members, which was effectively passed in early 2021 (Grahn, 2020; Preker, 2021). Despite these notable efforts, however, women are still structurally underrepresented at the board level in Europe (Michel, 2020; Deloitte, 2017).

One potential explanation for such underrepresentation of female board members is that corporate leadership teams still seem to base most promotion decisions on manifested stereotypes, implying that female personality characteristics are fundamentally different from their male counterparts (Ibarra, Ely & Kolb, 2013). Inadvertently, women are at a disadvantage when it comes to promotion decisions, given antiquated structures in organizations or other established cultural patterns that still tend to benefit men (Ibarra et al., 2013). One example of stereotypes hindering female promotion decisions is the belief that women are unable to serve in top management roles due to a rather emotional and passive nature inherent in their personality (Carli & Eagly, 2016).

Despite such subtle and invisible stereotype barriers for women's career advancement ambitions (Carli & Eagly, 2016; Eagly, 2007) there are still numerous women who do get promoted to top level positions in their respective field (Kossek & Buzzanell, 2018). Thus, the question arises – if these objectively successful women get promoted because their personality characteristics adhere to still existing male dominated stereotypes, or because these women's different and unique competencies, viewpoints, and cognitive abilities allow them to make a difference, and which characteristics gets them to the top faster (Lammers & Gast, 2017). Several meta-studies have indeed found that gender-diverse management teams deliver better performances (Wille, Wiernik, Vergauwe, & Vrijdags, 2018; Hoobler, Masterson, Nkomo, & Michel, 2016; Post & Byron, 2015). Accordingly, a higher share of women with non-agentic and more communal personality characteristics in top level positions would support an argument for a change in the way management teams make their promotion decisions (Eagly, 2016). Few studies, however, have been able to specify which type of females (e.g., personality types) actually get promoted to the top-level positions in their field these days (Wille et al., 2018).

To investigate what hinders or fosters objective career success through job promotion to the highest possible ranks, we first test if there are certain distinctive personality, psychosocial, and cognitive characteristics among women reaching the top compared to their male counterparts. Beyond that, we test if any specific characteristics speed up the time to get promoted to the top among women and men. We deliberately chose professional sports as a labor market laboratory (cf. Kahn, 2000) to contribute gender-specific evidence for high-performing female employees in "strong situation" labor markets, i.e., highly structured, with consistent job demands, competitive selection pressure, and unambiguous work environments (Judge & Zapata, 2015; Hyde 2014).

2. Background

To address our research question on whether distinct personality, psychosocial, and cognitive characteristics among women get rewarded with (fast) career promotion to the highest possible ranks in "strong situation" contexts, we examine the promotions of highly competitive German athletes. Their performance in their respective field qualified them for financial and non-financial support from "Deutsche Sporthilfe" foundation (DSH), a network supporting German top athletes with Olympic ambition. With about 5000 athletes, the DSH remains at a stable size, despite permanent expansion of international competitions. Its athletes are categorized in one of four "Kader" ranging from D (lowest, i.e. talent status) to A (highest, i.e. Olympic medal contender)[1]. The system remained stable for more than 30 years due to defined limits for each "Kader" (Landefeld, 2015). Promotion decisions are similar to professional soccer, or to professional service firms for that matter, as each sport's association decides each year on the basis of objective criteria (e.g., times or heights achieved) and subjective criteria (e.g., development potential of an athlete), which athlete will be promoted into the next higher "Kader", remain in its "Kader", or get demoted (cf. Kassis, Schmidt, Schreyer & Torgler, 2017; Landefeld, 2015). This result-oriented and hierarchical system allows a comparison of achievements from different sports as all

[1] Levels start at "D-Kader", i.e. national talent stage, move to "C-Kader", i.e. "almost professional level", and "B-Kader", i.e. "professional athlete level" to "A-Kader", i.e. "Olympic medal contender". The rank structure was reorganized to a three-level system, starting January 2018, but Data for our sample were still coded in the respective 4-Kader system equivalent.

athletes try to achieve the next higher tier,[2] which is also limited to a certain number of available spots, and is analogous to the structure of professional service firms (Merkel, Schmidt & Torgler, 2021).

These highly structured and unambiguous work environment characteristics – which heavily rely on objectively measurable performances – make for a designated labor market laboratory that links personality with labor market outcome in a "strong situation" context (Judge & Zapata, 2015; Judge & Kammermeyer-Mueller, 2007). Moreover, our setting provides an opportune environment for investigating personality-promotion linkages as it also addresses existing limitations of previous studies in sports, insofar as they often have a single-sided sports focus, especially on football (e.g., Kassis et al. 2017; Merkel, Schmidt & Torgler, 2017). Finally, in our setting we are dealing with intra-sex competition as women and men do not compete for the same top ranked spot. While, admittedly, this reduced external validity to some extent (despite recent quota laws for female board members, Preker, 2021), it also provides a unique – and almost laboratory-like environment – to investigate personality, psychosocial, and cognitive characteristics versus top rank requirement perceptions.

Before outlining the methodological approach in detail, we highlight the critical role personality traits play in the career advancement and success of women. To further guide our research question, we draw on two alternative perspectives regarding the role of personality in career progression to the top level that place clear job demands on the individual and are thus ideally suited for our "strong situation" context.

[2] Chances of achieving Olympic medals, World championships, or European Championships are considered (in the listed order).

2.1 Personality, cognition, and objective career advancement of women to the top

Career success generally tracks labor market success and can most commonly be objectively measured by pay, promotion, or occupational status (Dries, Pepermans, and Carlier, 2008). Nowadays, career advancement, measured by promotion, is most accurately predicted by a combination of cognitive ability and measures of personality, as traditional human capital predictors alone (e.g., education, experience, and levels of cognitive ability) did not sufficiently explain labor market success in the past (Groysberg, 2010; Finnie & Meng, 2001; Heineck & Anger, 2010).

So far, findings in career advancement research at the intersection of personality traits (measured by the Big Five), cognitive ability, and career success suggest that in general, the level of conscientiousness can positively predict objective as well as subjective career success (Judge, Higgins, Thoresen, Barrick, 1999). Moreover, objective career success was negatively predicted by high levels of neuroticism and general cognitive ability positively predicted measures of objective career success (Judge et al., 1999). Another recent study found that males scoring low on the tendency to be principled and high on cognitive processing speed get promoted to the professional level in football academies, a "strong situation" context that was also used to proxy career advancement at professional service firms (Kassis et al. 2017). Unfortunately, this study only followed men until the age of twenty-three.

Generally, women tend to receive higher scores on agreeableness and the enthusiasm aspect of extraversion, i.e., sociability and positive emotionality (Wille et al., 2018). Moreover, internalizing a leadership identity, a sense of purpose, and the confidence to act on these abilities are strong indicators of women who enjoy promotions to the highest possible ranks (Ibarra et al., 2013 & Ely et al., 2011). Executive women, i.e., women in top leadership positions, tend to score much higher on extraversion and facets of neuroticism, displaying agentic personality characteristics similar to their male counterparts and dissimilar to non-executive females (Wille et al., 2018). Consequently, the professional profile of top executive positions appears to be characterized by a strong agentic personality profile (Wille et al., 2018).

Meta-analysis showed that human perception of vocational leaders is still rather masculine and agentic (e.g., assertive or competitive) as opposed to female and communal (e.g., friendly and patient), and that gender roles and stereotypes still heavily contribute to the gender gaps in career success (Koenig, Eagly, Mitchell, and Ristikari, 2011, Powell, Butterfield, & Parent, 2002; Betz & Fitzgerald, 1987). Certain responsibilities and personality characteristics have manifested as being socially desirable for each sex (Diekmann & Eagly, 2000). For example, a family father has historically been expected to pursue a professional career, thus, personality characteristics associated with career success still largely overlap with characteristics central to the male gender role (Eagly & Karau, 2002). Given a general understanding of which societal perceptions still hinder women's parity in career success through job promotion, this research effort deliberately chooses a "strong situation" context in which women only compete against women (Cooper & Withey, 2009; Judge & Zapata, 2015). This setting allows us to focus on gaining a more nuanced understanding as to which agentic or communal personality traits would naturally facilitate career advancement to the highest possible ranks for women now that recent measures like quota laws will have women compete against other women for top level positions Preker, 2021; Spurk, 2017).

In making this choice, we also address further significant limitations of existing gender career success research. Unfortunately, very few studies have yet specified the concrete psychological characteristics that foster women's objective career success through job promotion (Wille et. al, 2018). Despite availability of more differentiated measures of personality traits (e.g., CSES or CAAS) and cognitive ability (e.g., two-component model of lifespan cognition), numerous studies merely rely on one traditional approximation of personality traits, such as the Big Five, when more nuanced measures of psychological and psychosocial characteristics are available (Kassis et al., 2017; Zacher, 2014; Schmitt et al. 2009). In addition, the few studies that have investigated the intersection of objective career success, personality traits, and cognitive ability using sports as a labor market laboratory have either limited sample sizes or focus on one specific type of sports (e.g., soccer; Kassis et al., 2017).

To further guide our research question of which agentic or communal personality characteristics foster women's career advancement through job promotion, we will discuss two alternative perspectives on the role of gender and personality in career advancement before deriving specific hypotheses.

2.2 The gender-invariant role demands perspective

The gender-invariant role demands perspective argues that top level positions are classified as "strong" situations, i.e., consistent job demands, constant selection pressure, and unambiguous work environments and that gender does not play a major role in these situations (Judge & Zapata, 2015). Implicit leadership theory explains why gender does not play a major role stating that leaders are chosen based on their perceived fit to our stereotypical tendency to promote people we perceive as "leader-like" (Shondrick, Dinh & Lord, 2010; Rosenthal & Pittinsky, 2006). The effect of this selection process not only influences the selection of top-level executives by others, it also influences our self-perception of what we believe a leader should be (Carbonell & Castro, 2008). Various studies find that perceptions of leadership potential, ability, and effectiveness are still dominated by agentic characteristics, such as assertiveness or competitiveness, and less by communal traits, such as friendliness or patience (Carli & Eagly, 2016). These perceptions in turn reinforce existing stereotypes that men might be better suited for promotion to leadership roles (Koenig et al., 2011). Consequently, if these criteria are applied across leadership roles in general, women eventually suffer from being evaluated against agentic stereotype criteria (Pullen & Vachhani, 2018). This puts women under immense pressure to adapt to those criteria and display exaggerated levels of confidence, assertiveness, and independence (Wessel, Hagiwara, Ryan & Kermond 2015). Furthermore, leadership roles appear to place relatively consistent job demands on the individual in terms of behavior and effective performance (Judge & Zapata, 2015).

Overall, implicit leadership theory, impression formation models, and job demand analysis suggest that strong selection pressure consistently favors masculine traits, thus men and women at the top ranks should both display agentic personality profiles, i.e., equal ascendancy pathways for men and women at executive level.

2.3 The changing leadership roles perspective

Much like the *gender-invariant role demands perspective*, the changing leadership roles perspective places clear and consistent role demands across genders. However, it acknowledges that the nature of leadership roles is changing. The recognition of these changing standards in leadership behavior assumes that men as well as women can leverage distinct trait profiles to get promoted to the very top ranks of their field. The multidimensional character of performance and leadership is recognized by this train of thought, i.e., it values unique personality characteristics and competencies as suitable for different distinct facets of performance and leadership (Campbell & Wiernik, 2015).

Traditional agentic criteria for promotion to top level positions emphasized the importance of rather "masculine" traits, such as initiating structure or inspirational motivation (Bono & Judge, 2004). The changing leadership roles perspective, however, acknowledges that more communal traits, which are often attributed as being "female" traits, such as empowerment, coaching, consideration, or intellectual stimulation (Campbell 2013; Bono & Judge, 2004) can be equally important for top level ascendency.

Given recent technological changes and increasing recognition of the importance of transformational leadership approaches, consideration, and related constructs (Sendjaya & Sarros, 2002), several meta studies showed the amplified relevance of inclusive communal trait merits (e.g., warmth, sensitivity, and understanding) and the gradual decrease of agentic traits (Koenig et al., 2011; Lipman-Blumen, 2000). Overall, this perspective suggests that women can reach top level positions by leveraging distinct communal personal strengths.

2.4 Hypotheses

After highlighting the importance of personality for career advancement, the two alternative perspectives on the roles of gender lead us to derive the following set of competing hypotheses to investigate our research question of whether distinct personality, psychosocial, and cognitive characteristics of women get rewarded with (fast) career promotion to the highest possible ranks even in "strong situation" contexts.

2.4.1 General gender differences in reaching the top ranks

The *gender-invariant role demand perspective* suggests that advancement to the highest possible ranks would be characterized by women displaying agentic traits as opposed to communal traits, thereby assimilating to male dominated stereotype criteria of leadership roles. A high degree of trait similarity can be expected when women are compared to male counterparts in analogous top rank positions. The *changing leadership roles perspective*, on the other hand, argues that females who get promoted to the highest possible ranks would show distinct communal traits. Especially in our within-sex competition setting in which women only compete against women for "A-Kader" spots, the role of male dominated stereotype criteria of leadership roles should exert less of an influence. As getting promoted to the highest possible ranks naturally is a development and correlates with time, other trait characteristics might be significant differentiating factors when considering the time taken to reach "A-Kader" status. The time that it takes to get promoted to the top ranks might very well be related to gender specific attributed traits, as they are found to be significant facilitators for achieving top level ascendency in within-sex competition environments. Additionally, few studies have investigated career adaptability in the workplace and its relation to gender specific objective career success (Spurk et al., 2019). Generally, it is expected that higher levels of career adaptability positively predict job promotions and therefore should reduce the time it takes to reach the top ranks (cf. Zacher, 2014).

Hypothesis 1a. *There are no significant differences in the effect of the relative agentic psychological traits by gender based on who gets promoted to the highest possible ranks and how fast one gets promoted.*

Hypothesis 1b. *Females with relatively higher agentic psychological traits have equal chances in being promoted or are promoted at similar speed (comparable career progression) than those females with relatively lower agentic psychological traits.*

Hypothesis 2. *Females who display relatively higher communal psychological traits are more likely to get promoted or take less time to get promoted to the top ranks.*

3. Data and Methodology

3.1 Data

Data were gathered from professional German athletes from a variety of sports in collaboration with Deutsche Sporthilfe foundation (DSH). DSH is a long-established foundation that (at the time of writing) financially supports German athletes in about 50 different sports. Based on information shared by DSH, we distributed a survey tool to a total of 3,340/1,497 current/former athletes. In sum, 521 (389/132) participants completed the online questionnaire sometime between January and May 2018. However, in our subsequent analysis, we only consider data from 299 (208/91) respondents for which full "Kader" promotion history was available. This sample includes 159 (119/40) female and 140 (89/51) male participants self-reporting information on the career adaptability scale (CAAS), personality traits, core self-evaluations (CSES), and two cognitive ability tests for *mechanics* or performance IQ (PIQ), i.e., basic information processing speed, and *pragmatics* or verbal IQ (VIQ), i.e., acquired knowledge (Lindenberger & Baltes, 1997).

Career adaptability. The 24-item scale German version of the CAAS was used in this study (Johnston et al. 2013). The CAAS consists of four subconstructs, i.e., concern, control, curiosity, and confidence (each consisting of six items). The scale measures individual psychosocial resources for career development. Participants answered on a scale from 1 (*not strong*) to 5 (*strongest*). Example items are "Concerned about my career" (concern), "Doing what is right for me" (control), "Becoming curious about new opportunities" (curiosity), and "Solving problems" (confidence).

Cronbach's alpha for the scale was 0.89, and alphas for the subconstructs were 0.80 (concern), 0.79 (control), 0.78 (curiosity), and 0.79 (confidence).

Big Five personality traits. The Big Five traits were measured with the well-established and widely-used 44-item German version scale (Lang et al. 2001). Example items for the scale are "Is outgoing, sociable" (extraversion; alpha = 0.86), "Is easily distracted" (reverse scored; conscientiousness; alpha = 0.79), "Gets nervous easily" (neuroticism; alpha = 0.83), "Likes to cooperate with others" (agreeableness; alpha = 0.69), and "Is sophisticated in art, music, or literature" (openness to experience; alpha = 0.77). Participants answered on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Core self-evaluations. Core self-evaluations were measured by 12-items in German adapted from the well-validated, reliable, and widely-used scale (Heilmann & Jonas 2010; Judge, Erez, Bono, and Thoresen 2003). An example item is "I am capable of coping with most of my problems". Participants answered on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alpha for the scale was 0.85.

Cognitive ability. Building on the two-component model of life span cognition, the two relevant dimensions of cognition – which have differing importance over time – are considered (Lindenberger 2001). *Mechanics* were measured with an ultra-short IQ-test, in which symbols and numbers need to be matched during a time window of 90 seconds (Dohmen et al. 2010). On the other hand, *pragmatics* were measured by a wording test in which the participant had to choose one out of five words, with only one being a real word (Lindenberger & Baltes 1997; Schupp, Herrmann, Jaensch & Lang, 2008). Both tests are valid approximations of the two major scales of the Wechsler Adult Intelligence Scale (WAIS), namely performance IQ (PIQ) and verbal IQ (VIQ), respectively with valid German versions available (Dohmen et al. 2010;

Heineck & Anger, 2010; Kaufmann & Lichtenberger, 2006). Furthermore, final tests were validated with the German Institute for Economic Research (DIW) in Berlin, in cooperation with the socio-economic panel (SOEP).

Primary data gathered by the constructed questionnaire were matched with purely objective data (e.g., "Kader" stage promotions) provided from the historic database of DSH via randomized unique identifier codes so that all participants stayed anonymous throughout the study. These data founded the basis for our investigation of the general psychological, psychosocial, and cognitive factor differences between female and male participants who get promoted to "A-Kader" status and our investigation of which attributes might facilitate a faster ascendancy to the top ranks.

Our control variables include age, recruitment age, DSH tenure, retired from sports career (alumni who quit their athletic career before June 2018 = 1, if still active in athletic career = 0), career break (in months), migration dummy (migration background = 1; no migration background = 0), and team (team sports = 1; individual sports = 0).

- - - Insert Table 1 about here - - -

3.2 Estimation

Specifically, we investigated the differences in the average marginal effect (AME) of personality on reaching the top rank between female and male in the following probit model:

$$\Pr(Reached\ rank\ A|\boldsymbol{x}) = \Phi(\alpha + \theta Trait_i + \lambda Female + \delta(Trait_i * Female) + \boldsymbol{\beta} Controls) \quad (1)$$

Our dependent variable $Reached\ rank\ A$ is derived from the official DSH database and considers all objectively observable promotions to "A-Kader" during one's athletic career[3]. Data for each person are available from the start of the DSH support until the end of the active sports career. We include the interaction terms between trait and female to assess whether the effect of trait on promotion differs across gender. Hence, the set of coefficients δ are of interest for our hypothesis testing as comparison between personality effects on male (benchmark) to that of female athletes.

Since inter-sex competition is absent in our setting, i.e., women do not have to compete against men to get promoted to the top ("A-Kader"), we standardized each personality variable ($Trait_i$) within each sex in the regression to test our first hypothesis[4]. As we shall see later, there are some considerable differences in the distribution of some targeted traits between female and male athletes; failing to correct for this would risk overestimating the effect δ.

The trait variables were selected based on their conceptual linkages, including 10 personality and psychosocial variables and two cognitive ability variables (see Table 1 for a detail description)[5]. We included CSES and the four subdimensions of the psychosocial construct CAAS in the analysis, in addition to the most widely accepted personality trait framework – the Big Five personality traits. CSES comprises a stable personality trait that consists of an individual's essential evaluations of themselves (Chang, Ferris, Johnson, Rosen, & Tan, 2012). High CSES scores are associated with rather agentic traits, such as a positive mindset, a high locus of control, and confidence in one's abilities (Judge, Erez, Bono, & Thoresen, 2002). The construct's relation to career success (Spurk, Hirschi, & Dries, 2019; Zacher, 2014; Judge & Bono, 2001) as

[3] Only reaching the A-Kader and having achieved at least a 3rd place in any international competition warrants PROMOTION = 1 to ensure a "strong situation", as defined by (Judge & Zapata, 2015).
[4] We first subtract each trait with its sex-specific mean and then divide the centered variable by the sex-specific standard deviation of the trait. The standardized variables have zero-mean and unit-variance within each sex.
[5] As promotion at DSH is heavily based on performance data for each cycle (e.g., times or heights achieved), we refrained from adding additional performance variables as independent variables.

well as other vocational criteria such as health (Best, Stapleton, & Downey, 2005), is well documented. CAAS, on the other hand, consists of four psychosocial resources, namely concern, control, curiosity, and confidence, which proved to be crucial for managing an employee's career development (Zacher, 2014). High levels of CAAS, especially concern and confidence, proved to be predictive of subjective career success, but its relation to objective career success is yet to be investigated in more detail (Spurk et al., 2019; Zacher, 2014).

Furthermore, to investigate whether personality factors impact the time it takes to be promoted (reaching "A-Kader" rank) and whether the strength of such influence differs between female and male, we employ the survival analysis framework (duration model or event history analysis) to model the difference in hazard for being promoted to "A-Kader". This approach accounts for censoring with time as a measure (in years since joining DSH), where right censoring occurs when the athletes were not promoted to A-Kader during their sporting career (taken as the date leaving DSH) or by the time of the survey. Specifically, we estimate the following hazards model with Cox regression:

$$\mathrm{h}(\mathrm{t},\mathbf{X}) = \mathrm{h}_0(\mathrm{t}) \exp(\mathbf{x\beta}) \tag{2}$$

where h(t) is the hazard function of promotion, with h_0(t) as the baseline hazard and $\mathbf{x\beta}$ are the linear predictors which include the full interaction terms of traits and female dummy and control variables. The estimated hazard ratio (HR) is interpreted as an increase in the likelihood of being promoted due to the unit difference in the independent variable per unit time (year). For example, for the female dummy (binary variable), a hazard ratio of 1.3 means that female athletes are 1.3 times more likely to be promoted to "A-Kader" compared to male athletes per year. For continuous variables, HR is interpreted as the increase in promotion likelihood per unit increase.

Our main focus is the interaction terms between the female dummy variable and each trait. This way we can test the speed differences in ascendency to the top rank hypotheses for female and male participants due to personality and cognitive factors (cf. chapter 2.4.2).

Due to the analysis setup which captures the information regarding participants' age, DSH tenure, and sports career status (active or retired), we removed them from the set of control variables. In addition, we include the decade of the DSH debut to control for cohort difference (e.g., promotion speed might differ due to the macro environment). Similar to the OLS analyses, we estimate three forms of specifications to assess the stability of the results, i.e., 1) single trait with female dummy and the interaction term, 2) Model 1 including the full set of control variables, and 3) all traits and their respective interaction term with female dummy and control variables. Furthermore, whilst the Cox proportional hazard assumption between female and male athletes is likely to hold (see Kaplan-Meier Curves in Figure A4), we nevertheless estimate a stratified Cox model (based on the specification of Model 3) with baseline hazard function (h_0(t)) stratified by sex.

3.3 Sample description and comparability.

Overall 63 percent of the participants were younger than 31 years of age (M = 30.93, SD = 11.51) when the survey was conducted. While the female sample is on average younger than male participants (difference of 3.62 y, p = 0.007), there is no statistically significant difference (p = 0.56) in terms of recruitment age (age when joining DSH). The two samples are also comparable in other aspects (Table A1). For example, the share of participants who play in team sports (vs individual sports) and with migration background also do not differ across gender. The proportion of retired athletes is greater in male rather than female sample (difference of 11.3 percentage points, $p = 0.035$). Not unexpectedly, female participants have a longer career break (difference of 4.16 months, $p = 0.012$) on average, perhaps due to pregnancy and parental leave.

Overall, 50.84% of athletes reached the "A-Kader" stage at some point during their DSH tenure. Perhaps as a result of sex-specific membership promotion structure, the proportion of athletes achieving rank "A-Kader" do not differ between female and male ($p = 0.726$). Moreover, the distribution of the career highest rank ($p = 0.83$) and the distribution of starting rank (rank upon joining DSH) ($p = 0.896$) also do not differ statistically between sex (see Table A2).

Furthermore, we find significant gender differences in targeted personality traits (see Figure A1), which justify the within-sex standardization treatment. For example, we find that female participants, on average, score higher in agreeableness (Cohen's $d = 0.246$, $p = 0.035$) and neuroticism ($d = 0.694$, $p < 0.001$), among the Big Five personality traits. Male athletes have higher core self-evaluation (CSES) scores ($d = 0.511$, $p < 0.001$) and career adaptability (CAAS) scores ($d = 0.35$, $p = 0.003$) on average than their female counterparts. The differences in CAAS scores are likely contributed by the subcomponents *control* ($d = 0.527$, $p < 0.001$) and *curiosity* ($d = 0.325$, $p = 0.005$). Nonetheless, we do not find substantial sex differences in cognitive ability tests for performance IQ (PIQ) or verbal IQ (VIQ).

In Figure A2, we show the correlations between predictive variables (standardized within-sex) and control variables.

4. Results

We first estimate interaction effect probit models to compare the difference in AME of each personality trait on promotion between female and male. To examine the robustness of results given the high correlation between targeted personality traits, we estimated three types of models and assess whether the estimated effects remain stable across the models. In the first model, we include only *one* personality factor, along with a female indicator variable and the interaction term between the two. The second model extends Model 1 by including control variables (non-personality related) as described in Section 3, which include participants' age (in years), recruitment age (in years), DSH tenure (in years), dummy variables for migration background, team sports, active sports career, and career break (in months). Model 3 further incorporates all personality factors and their interaction terms with the female indicator. We first present the effect of personality factors on promotion concerning male participants to establish a benchmark (based on θ estimates, Figure 1). Then, we will assess whether such effect differs for the female counterpart by showing the difference in AME with the interaction terms (based on δ estimates, Figure 2). The full regression results are shown in Appendix Table A3 to A5.

4.1 Testing sex differences in promotion

We analyze and compared the AME of personality and cognitive ability on promotion to the "A-Kader" for each sex. Specifically, we investigate the average of the change in the probability of reaching rank A when the levels of personality and cognitive ability changed by one standard deviation (SD) from the sex-specific mean. To do that, we first show the predicted AME of each personality trait on promotion from the three Models for the male athletes to establish a benchmark for the across sex comparison in Figure 1. In general, we do not observe a significant effect from personality traits on male athlete's promotion with the exception of conscientiousness and neuroticism (in Model 2 and Model 3) when control variables are included in the model. For male athletes, conscientiousness is negatively correlated with promotion. A one SD increase in conscientiousness (compared to the male average) is associated with -0.062 (p = 0.027, Model 2) and -0.048 (p = 0.071, Model 3) change in promotion probability, i.e., lowered by 4.8 to 6.2 percentage points. Neuroticism is positively associated with promotion for male – 1 SD increase in neuroticism (compared to the male average) increases promotion probability by .082 (p = 0.013, Model 2) to .07 (p = 0.09, Model 3), i.e., 7 to 8.2 percentage points.

- - - Insert Figure 1 about here - - -

Overall, we find the effects of personality traits on promotion for female athletes do not differ significantly from their male counterparts (in relative terms). In particular, similar to the male athlete sample (Figure 2, left panel), conscientiousness (neuroticism) seems to negatively (positively) predict promotion. While the effect sizes of these two traits for female athletes were estimated to be almost double that of male in Model 3 (the AME_{CONS} = -0.076, p = 0.018 and AME_{NEUR} = .151, $p < 0.001$), the between-sex differences of these estimates are not statistically significant, nor are the estimates of other Big Five personality traits in the other models (Figure 2, right panel). The only significant cognitive effect observed for female athletes who reach "A-Kader" status is higher VIQ scores (in Model 1), which is likely due to age correlation effects (Lindenberger, 2001). Relative sex-differences in the effect of the two cognitive factors considered are also absent. For CAAS scores, we did not find any statistically significant effect on either male or female athletes' chance of promotion. Nevertheless, when we re-estimate Model 3 with the four subcomponents of CAAS substituting the composite score (Table A6), we find that the subconstructs *concern* and *curiosity* positively and negatively predict male athletes' promotion success (at 5% level of statistical significance), respectively. Yet, we only find a slight relative sex difference (at 10% level) in terms of *concern*.

We find that for female athletes, having higher core self-evaluation scores (CSES) (relative to other females) significantly increases the probability of being promoted to the “A-Kader” (Model 1 and 3) and the AME was found to be significantly larger than for the male athletes (Model 2 and 3) (in relative terms). Female individuals, who score high on CSES “think positively of themselves, feel in control of their lives, and are confident in their abilities.” (Zacher, 2014, p. 23). Since CSES proxies agentic psychological traits, such as higher levels of self-esteem, self-efficacy, and internal locus of control, this is further manifesting the *gender-invariant role demand perspective* as expressed in Hypothesis 1a, which means that Hypothesis 1a cannot be rejected. It is particularly noteworthy that the *gender-invariant role demands perspective* prevails even in our within-sex competition setting. This could imply a deep stereotype manifestation in “strong situation” contexts applied across leadership roles in general. Even if females are not directly competing against males, females seem to suffer from being evaluated against these agentic stereotype criteria (Pullen & Vachhani, 2018; Judge & Zapata, 2015). Even more so, higher CSES scores for females are likely to represent overly strong adherence to such stereotype expectations (Pullen & Vachhani, 2018; Wille et al., 2018). Thus, our results also provide evidence against Hypothesis 1b (in favor of rejection).

On the other hand, Hypothesis 2 is unlikely to hold (rejected) as we did not find any significant sex difference in the effect of traits that suggest higher communal values (psychological sense of community) on career promotion, including agreeableness and conscientiousness (organization and cautiousness).

- - - Insert Figure 2 about here - - -

While the two sexes are not competing with each other on promotion, female athletes seem to have a higher chance of being promoted (at 10% statistical significance throughout Model 2). In terms of other controls, we find that recruitment age and DSH tenure both positively predict “A-Kader” promotion. Additionally, athletes with a migration background are more likely to have achieved “A-Kader”.

Using Model 3, we assess the stability of the relative sex difference in the estimates of CSES by examining the subsample of participants with a DSH-tenure longer than two years (n = 253) or the sample of participants aged above 25 years[6] (n = 183) to allow a realistic timeframe for a potential promotion to the “A-Kader” for each individual. In order to mitigate any potential overrepresentation effects of older and more successful members through self-selection (participation bias) we split the sample of participants by sports career status (active athletes (n = 208) or retired athletes (n = 89)) to test the sensitivity of the results. We present the robustness checks in Figure A2. We find that the relative sex difference for CSES is statistically significant using the four subsamples. Moreover, we find a small sex difference in neuroticism for the subsample of participants with at least two years of DSH tenure and retirees.

Overall, our results evidently further support the *gender-invariant role demand perspective* as opposed to the *changing leadership roles perspective*. Thus, Hypothesis 1a cannot be rejected and Hypothesis 1b and 2 are rejected.

4.2 Testing sex differences in ascendancy speed

To test the effect of each personality and cognitive factor on the speed of promotion by sex, we analyze their effect on the hazard h_i(t), which describes athlete *i*’s probability

[6] The median age to reach rank A, excluding those who were ranked A upon joining DSH, is 24 years (mean = 22.7).

of being promoted to “A-Kader” at time *t*, differentiated by male and female participants. From the Kaplan-Meier curves shown in Figure A4, we see that promotion of female athletes occurred earlier than their male counterparts. This is confirmed by the consistent HR estimates between 1.51 to 1.74 in Model 1 to Model 3 (see Table A7 to A9). Holding this sex difference in the timing of promotion in mind, we again find that core self-evaluation (CSES) has a positive effect on the likelihood of being promoted over the course of females’ athletic career (in contrast to males’), as shown by the statistically significant HR estimates (Female*CESE interaction term in Figure 3 (Model 2 to 4)). On the other hand, whilst two Big Five personality traits, namely conscientiousness and neuroticism, exert a negative and positive effect on the promotion chance of both female and male athletes, respectively, such effects do not differ across sex.

- - - Insert Figure 3 about here - - -

Similar to previous findings, the analysis again gives support to the *gender-invariant role demand perspective* (Hypothesis 1a), as the lack of sex difference in how agentic personality characteristics can explain the dynamic ascendancy speed to the “A-Kader” (cf. 4.1). However, the results also show that non-agentic and more communal personality characteristics (such as agreeableness) do not mean less time to reach the top for female athletes, hence rejecting Hypothesis 2. These results are in contrast with more recent perspectives that women are able to reach top level positions by leveraging distinct personal strengths of the more inclusive and communal kind (Koenig et al., 2011; Lipman-Blumen, 2000).

We again did not find any significant effect of CAAS in the ascendancy speed of athletic careers, nor there is any difference between the two sexes. However, when we substitute the composite score with the four CAAS subconstructs (Table A10), we find that for male athletes, *concern* (*curiosity*) increases (reduces) the likelihood of being promoted, while such effects were not visible among female athletes (both interaction terms are statistically significant[7]). This is particularly interesting since CAAS's predictive power to explain objective career success as opposed to subjective career success, as proxied by career satisfaction, is not yet sufficiently studied (Spurk et al., 2019, Zacher, 2014).

The relative sex differences and importance of the capability to adapt with respect to speed of promotion is a unique finding; thus, we encourage other career success scholars to further investigate this specific relationship component of objective career success and CAAS, and to explore such a relationship with similar constructs. Overall, our results seem to suggest that different aspects of career adaptability affect male, but not female, athletes' career progress. Thus, this gender-specific differentiation provides some support on the *changing leadership roles perspective* with regards to the time it takes to get promoted to the top.

5. Conclusions

The results of our analysis indicate a high degree of similarity in general personality and cognitive attributes between the sexes who reach the highest level "A-Kader" promotion. This implies a deep stereotype manifestation of top-level leadership role demand criteria in "strong situation" contexts, where females are still evaluated against these agentic stereotype criteria (Pullen & Vachhani, 2018; Judge & Zapata, 2015). Even more so, higher CSES scores for females (compared to their male counterparts) are likely to represent overly strong adherence to such stereotype expectations (Pullen

[7] We also confirm the null effect for female athletes by estimating Model 3 and 4 with female subsample (results are available upon request).

& Vachhani, 2018; Wille et al., 2018). Consequently, our results provide further support for the *gender-invariant role demand perspective* in explaining existing labor market success differentials for top level executives (Wille et al., 2018; Heineck & Anger, 2010). Our results appear even more noteworthy, because – despite our laboratory like “strong situation” context, in which clear demands are placed on performance and we are dealing with within-sex competition – promotion to the top level for females still favors agentic stereotype traits. Despite recent efforts to pass quota laws for female board membership in German companies, our results clearly indicate how hard it is to change deeply embedded stereotypes of agentic leadership criteria, if the *changing leadership roles perspective* cannot even prevail in a competitive setting in which women only compete against women.

However, despite no significant sex differences in the time it takes to reach “A-Kader” rank in general, more communal and inclusive personality traits, such as agreeableness, are significantly accelerating female promotion to the top. In line with the *changing leadership roles perspective*, leveraging such distinct personal strengths can be an important foundation for promotion to the top. Through recent measures like quota laws, women might literally compete against other women for top level positions in the future, which will eventually result in less assimilation towards more agentic stereotypes over time.

Interestingly, male participants with relative higher *concern* and low *curiosity* scores take less time to get promoted to the “A-Kader” rank, whereas none of the CAAS subconstructs affect relative female’s time to reach “A-Kader”. Adaptive capability appears to be the differentiating element for accelerated promotion in more male dominated “strong situation” settings, as is the case in professional service firms.

Admittedly, the study is limited by its sample size, its cross-sectional design and its German focus. Therefore, for the findings to be generalizable, future research should attempt to use a larger data pool that includes individuals from different geographies, controls for potentially developing personality attributes, and uses panel analysis tracking individuals over time (Specht, Egloff, & Schmukle, 2011). Furthermore, the degree of overrepresentation (participation bias) of more successful older athletes presents another limitation of our data. Although we cannot find any structural differences between still active and retired athletes (see Figure A2), it cannot be completely ruled out. Moreover, generalizability to other environments might be problematic due to the high promotion rates to the top (compared to other leading positions in management (e.g., CEOs) or politics).

What is more, despite recently passed quota laws (Grahn, 2020; Preker, 2021), the absence of inter-sex competition in the current setting certainly reduces external validity in the management context where females do in fact compete with males for top management or leadership roles. Nevertheless, our study contributes to a better understanding of the relationship of personality, psychosocial, and cognitive factors towards objective career success in highly structured and unambiguous environments by quantifying the specific interaction effects of crucial predictors of objective career success.

Human resource professionals should try to focus their efforts on breaking up deeply rooted agentic stereotypes of leadership role demands, by deliberately defining diverse and strength-based leadership role profiles that naturally allow for a higher degree of diversity. This effort needs to start at the top and quotas can only represent a welcome starting point to break through existing stereotype frontiers. Moreover, tailored career development programs should be enacted to create awareness of such stereotypes among both sexes. Programs focused on female career development should particularly emphasize and encourage a positive perception of their own abilities.

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Tables and Figures

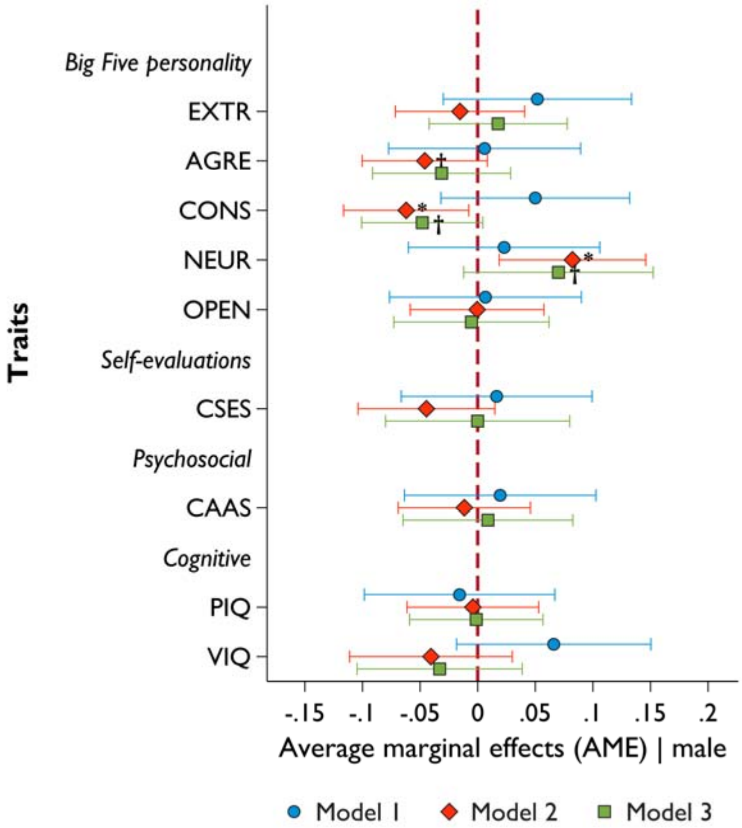
Table 1. Variable definition, measurement, and rationale for use

Variable	Mean	SD	Definition and Measurement			Rational for including variable
Dependent variable						
PROMOTED	0.49	0.50	1= achieving highest "A-Kader" level in the athlete career; 0= not achieving highest "A-Kader" level.			Career progression is the major objective of players in their professional sports career (Schmidt, Torgler & Jung, 2017)
Independent variables						
Personality factors			44 question survey, between 8 and 10 questions per trait: 0-5 score based on BFI-44			Big Five as most widely used personality trait measurement (Judge & Zapata, 2015; Lang, Lüdtke, & Asendorpf, 2001)
Conscientiousness (CONS; α: 0.79)	4.00	0.51	easy-going/flexible	**vs**	efficient/structured	Positive correlation between conscientiousness and both types of career success (Judge et al., 1999)
Neuroticism (NEUR; α: 0.83)	2.45	0.65	negativity/self-reliant	**vs**	positivity/self-conscious	Negative relation between objective career success and individuals with high levels of self-consciousness (Ng, Eby, Sorensen, & Feldman, 2005).
Extraversion (EXTR; α: 0.86)	3.65	0.67	reserved/team-oriented	**vs**	enthusiastic/independent	Some positive correlation between extraversion and objective career success, especially in jobs with high interaction levels (Seibert & Kraimer, & Crant, 2001).

Agreeableness (AGRE; α: 0.69)	3.69	0.45	challenging/detached	**vs**	friendly/compassionate	Some negative correlation between agreeableness and objective career success (Judge & Kammeyer-Mueller, 2007)
Openness (OPEN; α: 0.77)	3.41	0.55	consistent/cautious	**vs**	inventive/curious	Little consistent correlation between openness and both types of career success (Judge & Kammeyer-Mueller, 2007).
Other						
CSES (*α: 0.85*)	3.78	0.54	Stable personality trait that involves people's fundamental evaluations of themselves (Chang, Ferris, Johnson, Rosen, & Tan, 2013; Judge et al., 2003)			12-items in German adapted from the well-validated, reliable, and widely-used scale (Heilmann & Jonas, 2010).
Psychosocial factors						
CAAS *(α: 0.89)*	3.57	0.47	The CAAS consists of four subconstructs, i.e. concern (*α: 0.80*), control (*α: 0.79*), curiosity (*α: 0.78*), and confidence (*α: 0.79*) each consisting of six items (Savickas & Porfeli, 2012)			The 24-item scale German version of the CAAS was used in this study (Johnston et al., 2013).
Cognitive factors						
PIQ *(cognitive processing)*	37.66	10.35	Number of correct answers in number-symbol correspondence test within 90 seconds timeframe (Dohmen, Falk, Huffman, & Sunde, 2010).			Cognitive ability positively influences productivity, which is indicative of facilitating objective career success (Heineck & Anger, 2010; Lindenberger, 2001).
VIQ (*acquired knowledge*)	29.77	2.86	Number of correct answers in a 36-question word recognition test (Schupp et al., 2008).			

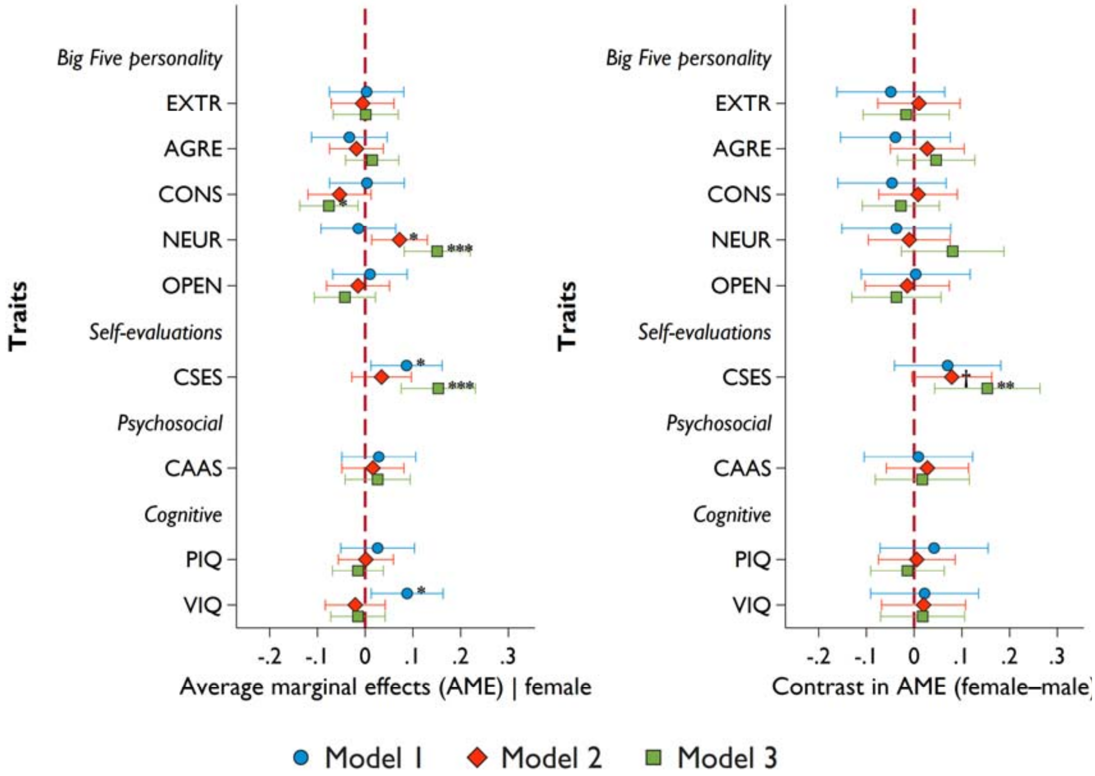
Notes: N = 299. Control factors are Recruitment age (in years), DSH tenure (in years), retired (alumni who quit their athletic career before June 2018 = 1, if still active in athletic career = 0), career break (in months), migration dummy (migration background = 1; no migration background = 0), team (team sports = 1; individual sports = 0).

Figure 1. AME of personality and cognitive factors on promotion to "A-Kader", male athletes benchmark



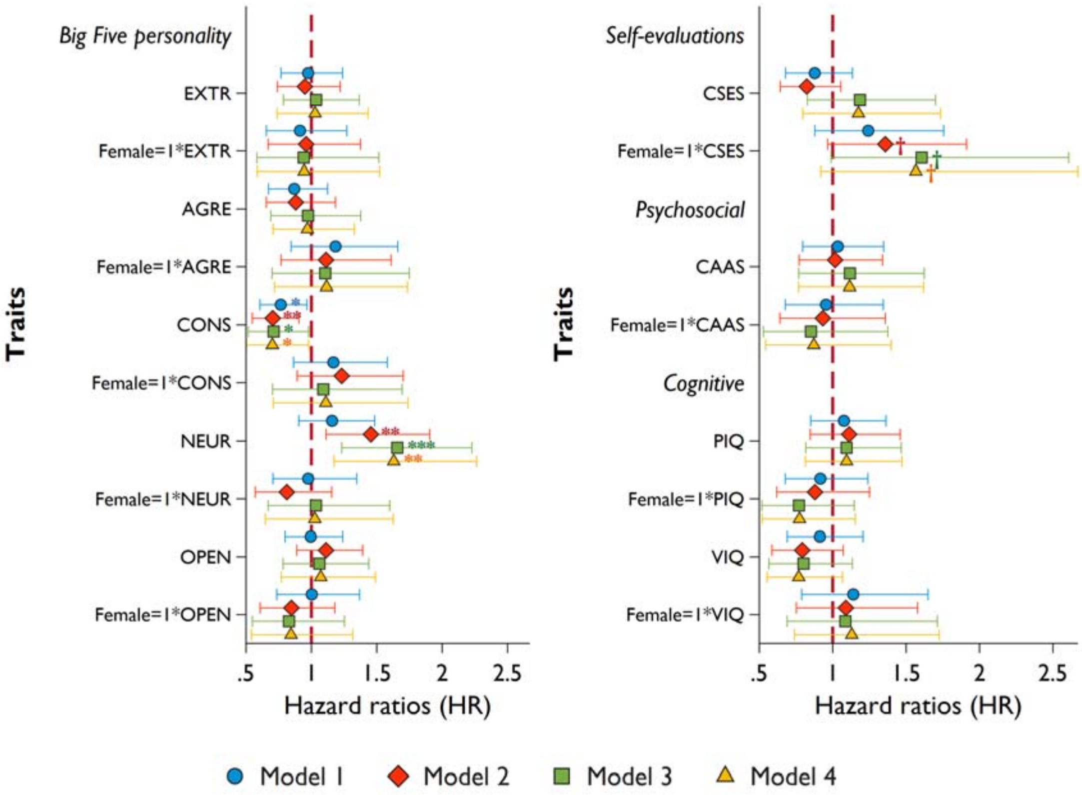
Notes: N = 299. Error bars are 95% confidence intervals (CI). †p<0.1, *p < 0.05, **p < 0.01. Model 1 – Single trait without control variables. Model 2 – Single trait with control variables. Model 3 – All traits with control variables.

Figure 2. AME of personality and cognitive factors on promotion to “A-Kader” for female athletes and female–male contrast



Notes: N = 299. Error bars are 95% confidence intervals (CI). †p<0.1, *p < 0.05, **p < 0.01, ***p < 0.001. Model 1 – Single trait without control variables. Model 2 – Single trait with control variables. Model 3 – All traits with control variables.

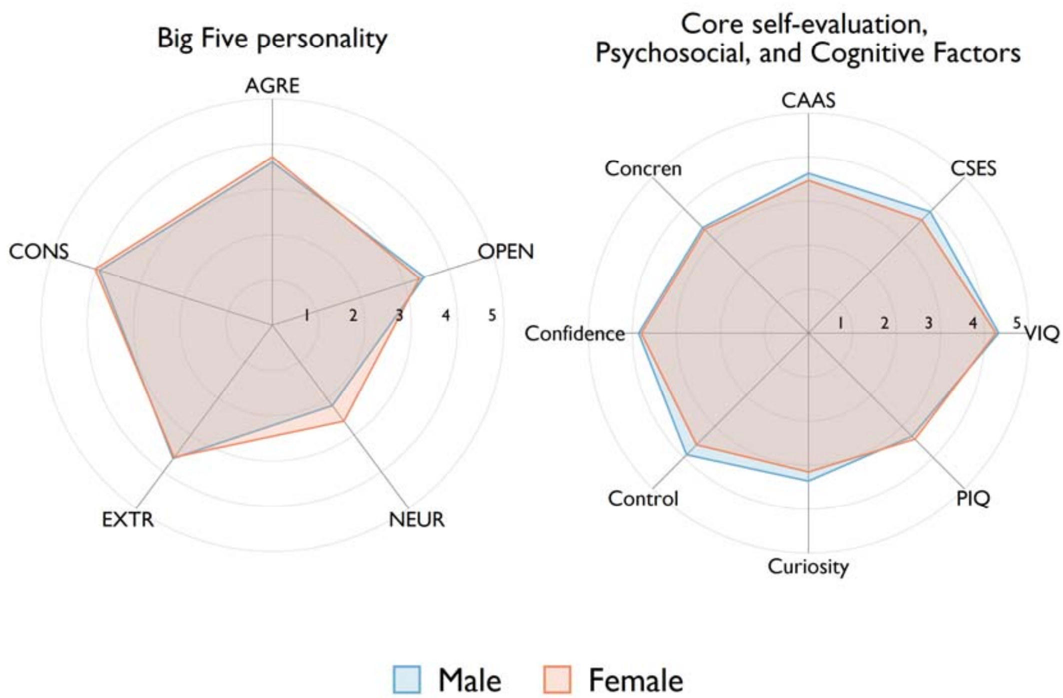
Figure 2. Hazard ratios of being promoted to "A-Kader"



Notes: N = 299. Error bars are 95% confidence intervals (CI). †p<0.1, *p < 0.05, **p < 0.01. Model 1 – Single trait without control variables. Model 2 – Single trait with control variables. Model 3 – All traits with control variables. Model 4 – All traits with control variables, with baseline hazard stratified by participants' sex.

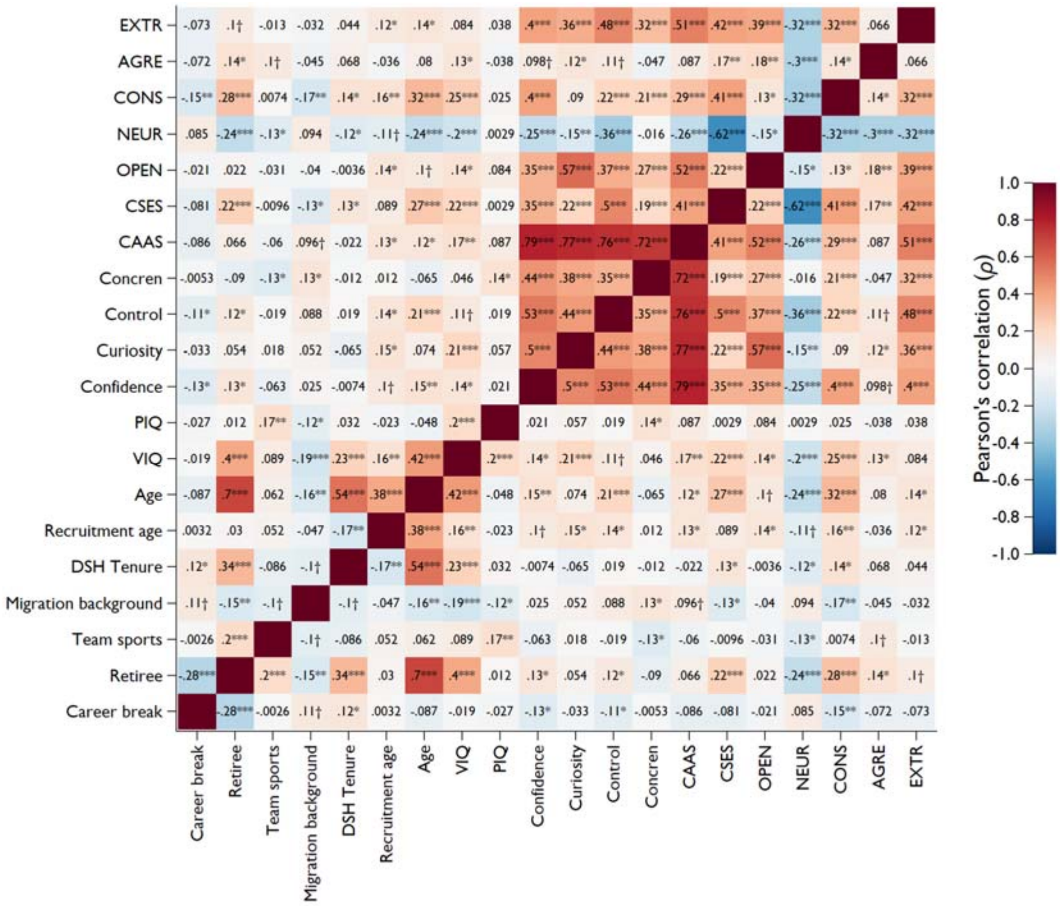
APPENDIX

Figure A1. Sex difference in personality traits and cognitive abilities.



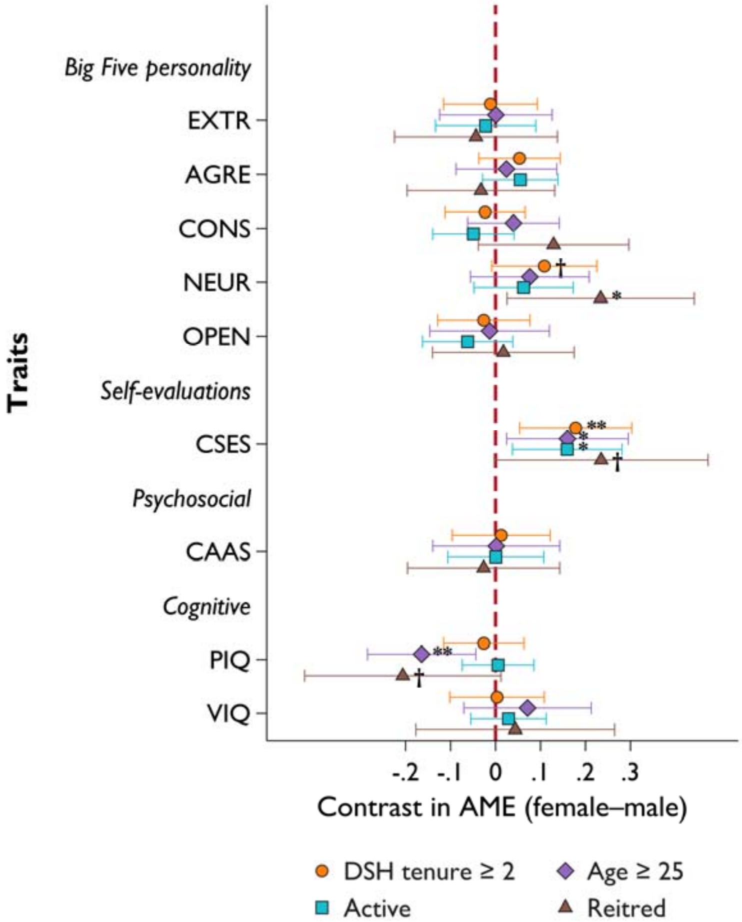
Notes: Sex-specific sample averages were calculated using the raw values (scale from 1 to 5), except for VIQ and PIQ, which were rescaled based on the respective maximum value.

Figure A2. Correlation between personality traits, cognitive abilities, and control variables.



Notes: Personality traits and cognitive abilities are standardized within sex. †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively (two-tailed).

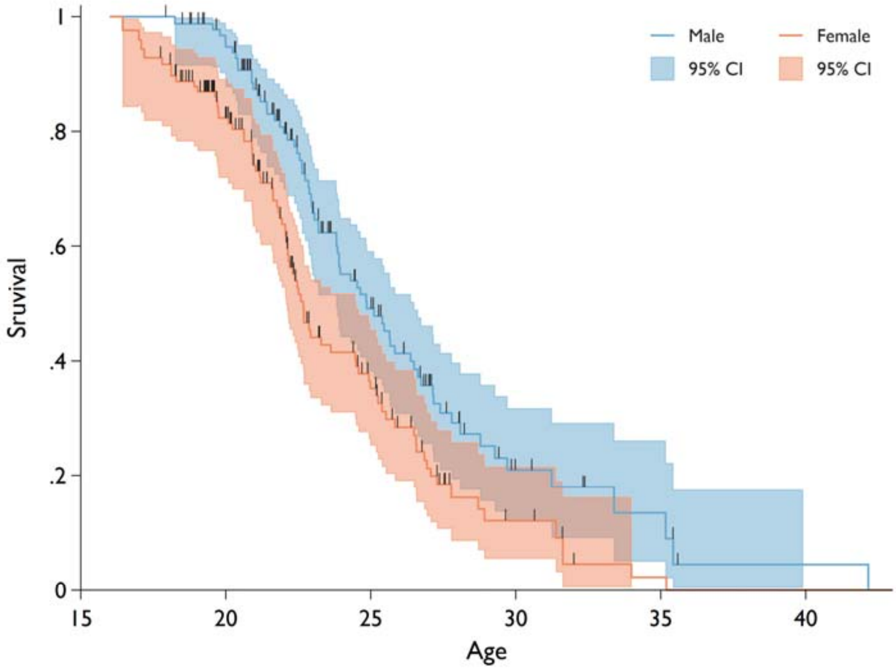
Figure A3. Robustness checks: Sex difference in AME of personality and cognitive factors on promotion, athletes with two years of DSH tenure, active athletes, and retirees.



Notes: Sample size = 253 (DSH tenure ≥ 2), 183 (Age ≥ 25), 208 (active athletes), and 89 (retirees), respectively. Error bars are 95% confidence intervals (CI). †$p<0.1$, *$p < 0.05$, **$p < 0.01$.

Figure A4

Kaplan-Meier survival curves for male and female athlete participants on A-Kader promotion



Notes: Sample size = 140 (male) and 159 (female). Colored area represents 95% confidence intervals (CI). Log-rank test for equality of survivor functions $p = 0.0082$.

Table A1
Summary statistics and between-sex differences

	Male (n = 159)	Female (n = 140)	Diff.	Test stat.	*p*-val.
A-Kader[a]	0.493	0.490	-0.002	0.04	0.969
Highest rank[b]				0.37	0.830
Starting rank[b]				0.60	0.896
Age (June 2018)[c]	32.85 (12.08)	29.23 (10.74)	3.62**	2.74	0.007
Age (DSH entry)[c]	18.88 (4.72)	18.51 (4.65)	0.36	0.67	0.502
DSH tenure (years)	8.46 (5.52)	7.78 (5.28)	0.68	1.09	0.277
Team sports[a]	0.29	0.33	-0.03	-0.64	0.52
Migration[a]	0.07	0.1	-0.03	-0.89	0.37
Retired[a]	0.36	0.25	0.11*	2.11	0.035
Career break (months)[c]	3.93 (7.29)	8.09 (18.25)	-4.16*	-2.52	0.012
Traits (raw score)					
Big Five[c]					
Extraversion	3.67 (0.65)	3.63 (0.69)	0.04	0.44	0.66
Agreeableness	3.63 (0.42)	3.74 (0.48)	-0.11*	-2.12	0.035
Conscientiousness	3.95 (0.52)	4.05 (0.50)	-0.1	-1.56	0.12
Neuroticism	2.22 (0.60)	2.64 (0.62)	-0.42***	-5.99	<.001
Openness	3.47 (0.50)	3.36 (0.59)	0.11	1.64	0.1
CSES[c]	3.93 (0.51)	3.66 (0.53)	0.27***	4.41	<.001
CAAS[c]	3.65 (0.42)	3.49 (0.49)	0.16**	3.02	0.0027
Concern	3.42 (0.62)	3.36 (0.65)	0.06	0.77	0.44
Control	3.93 (0.55)	3.62 (0.65)	0.31***	4.55	<.001
Curiosity	3.38 (0.63)	3.18 (0.65)	0.20**	2.8	0.0054
Confidence	3.88 (0.53)	3.82 (0.54)	0.06	0.98	0.33
Mechanics (PIQ)[c]	36.89 (10.61)	38.34 (10.10)	-1.45	-1.21	0.23
Pragmatics (VIQ)[c]	30.06 (2.64)	29.50 (3.03)	0.56†	1.7	0.091

Notes: [a] Two-sample test of proportion (z). [b] Pearson's chi-squared test (χ^2). [c] Two sample t-test (t). Standard deviation in parentheses. †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively (two-tailed).

Table A2
Distribution of highest rank and starting rank, by gender.

Highest rank	Male (%)	Female (%)	Total (%)
A	72 (51.43%)	85 (53.46)	157 (52.51)
B	45 (32.14%)	46 (28.93%)	91 (30.43%)
C	23 (16.43%)	28 (17.61%)	51 (17.06%)
Starting rank	Male (%)	Female (%)	Total (%)
A	17 (12.14%)	19 (11.95%)	36 (12.04%)
B	21 (15%)	20 (12.58%)	41 (13.71%)
C	88 (62.86%)	106 (66.67%)	194 (64.88%)
D	14 (10%)	14 (8.81%)	28 (9.36%)

Table A3 Probit model (Model 1)

Model 1	*Big Five personality traits*					*Self-evaluation*	*Psychosocial*	*Cognitive*	
	EXTR	AGRE	CONS	NEUR	OPEN	CSES	CAAS	PIQ	VIQ
Male*Trait	.131	.0151	.126	.0577	.0169	.0413	.049	-.0394	.168
	(.107)	(.107)	(.107)	(.107)	(.107)	(.106)	(.107)	(.106)	(.112)
	.0518	*.00603*	*.05*	*.023*	*.00672*	*.0165*	*.0195*	*-.0157*	*.066*
Female*Trait	.00745	-.0834	.00921	-.0358	.0253	.223*	.0715	.0656	.226*
	(.0997)	(.102)	(.1)	(.1)	(.0996)	(.102)	(.0997)	(.0995)	(.104)
	.00297	*-.0331*	*.00367*	*-.0143*	*.0101*	*.0867*	*.0285*	*.0261*	*.0879*
Female dummy	-.00498	-.00612	-.00536	-.00572	-.00578	-.00687	-.00586	-.00586	-.00763
	(.146)	(.146)	(.146)	(.146)	(.146)	(.146)	(.146)	(.146)	(.147)
	-.0021	*-.00242*	*-.00226*	*-.00228*	*-.0023*	*-.00225*	*-.00232*	*-.00231*	*-.00265*
Constant	-.0187	-.0179	-.0183	-.0179	-.0179	-.018	-.0179	-.018	-.0182
	(.106)	(.106)	(.106)	(.106)	(.106)	(.106)	(.106)	(.106)	(.107)
N	299	299	299	299	299	299	299	299	299
McFadden's R^2	0.004	0.002	0.003	0.001	0.000	0.012	0.002	0.001	0.018
Wald χ^2	1.500	0.685	1.397	0.421	0.091	4.872	0.728	0.574	6.999
BIC	15.598	16.379	15.695	16.677	17.010	12.120	16.376	16.533	9.693

Notes: Dependent variable = Promotion to "A-Kader". Robust standard errors in parentheses. Marginal effects in italics. AMEs for traits are computed for male and female, respectively. †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A4 Probit model (Model 2)

Model 2	*Big Five personality traits*					*Self-evaluation*	*Psychosocial*	*Cognitive*	
	EXTR	AGRE	CONS	NEUR	OPEN	CSES	CAAS	PIQ	VIQ
Male*Trait	-.0606	-.183	-.249*	.34*	-.00191	-.175	-.0458	-.0165	-.159
	(.113)	(.113)	(.113)	(.136)	(.117)	(.12)	(.116)	(.115)	(.143)
	-.0154	*-.0459*	*-.062*	*.0823*	*-.000484*	*-.0445*	*-.0116*	*-.0042*	*-.0406*
Female*Trait	-.0204	-.0712	-.211	.289*	-.0578	.136	.0629	.00544	-.0806
	(.13)	(.112)	(.135)	(.124)	(.13)	(.127)	(.129)	(.114)	(.124)
	-.00528	*-.0183*	*-.0537*	*.072*	*-.015*	*.0343*	*.0162*	*.00141*	*-.0207*
Female dummy	.287†	.305†	.309†	.328†	.286†	.292†	.284†	.284†	.297†
	(.169)	(.17)	(.174)	(.175)	(.168)	(.172)	(.168)	(.168)	(.169)
	.0739	*.0761*	*.0777*	*.0806*	*.0735*	*.0735*	*.0734*	*.0732*	*.0756*
Participants' age	.0225	.0225	.0263	.0271	.0223	.0258	.0223	.0218	.0248
	(.0175)	(.0176)	(.0179)	(.0178)	(.0174)	(.0176)	(.0175)	(.0174)	(.0184)
	.0058	*.00578*	*.00667*	*.00673*	*.00576*	*.00659*	*.00576*	*.00564*	*.00641*
Recruitment age	.109***	.104***	.113***	.11***	.109***	.104***	.107***	.108***	.108***
	(.029)	(.029)	(.0297)	(.0293)	(.0288)	(.0295)	(.0291)	(.0287)	(.0293)
	.0283	*.0266*	*.0288*	*.0274*	*.0283*	*.0266*	*.0276*	*.028*	*.0278*
DSH tenure	.171***	.17***	.173***	.175***	.171***	.168***	.169***	.171***	.17***
	(.0248)	(.0249)	(.026)	(.0256)	(.0248)	(.0247)	(.0248)	(.0252)	(.0255)
	.0441	*.0437*	*.0439*	*.0434*	*.0441*	*.043*	*.0437*	*.0441*	*.0439*
Migration	.788**	.76**	.715**	.753**	.803**	.756**	.781**	.788**	.72**
	(.27)	(.26)	(.276)	(.263)	(.272)	(.272)	(.273)	(.267)	(.267)
	.204	*.195*	*.181*	*.187*	*.207*	*.193*	*.201*	*.204*	*.186*
Team	.263	.28	.259	.361†	.262	.294	.278	.268	.263
	(.207)	(.208)	(.21)	(.207)	(.207)	(.207)	(.206)	(.21)	(.209)
	.068	*.0718*	*.0657*	*.0895*	*.0678*	*.0752*	*.0717*	*.0692*	*.0679*
Retired	-.014	.0364	.0441	.105	-.0155	-.0338	.000584	-.0108	.0502
	(.309)	(.308)	(.319)	(.313)	(.309)	(.309)	(.307)	(.309)	(.312)
	-.00362	*.00934*	*.0112*	*.0261*	*-.00401*	*-.00864*	*.000151*	*-.0028*	*.013*
Career break	-.0129	-.0126	-.0145†	-.0142	-.0129	-.013	-.0123	-.0128	-.0118
	(.00888)	(.00862)	(.00844)	(.00864)	(.00868)	(.00894)	(.00909)	(.00887)	(.00859)
	-.00332	*-.00322*	*-.00367*	*-.00353*	*-.00333*	*-.00331*	*-.00318*	*-.00331*	*-.00305*
Constant	-4.32***	-4.25***	-4.54***	-4.59***	-4.32***	-4.31***	-4.27***	-4.28***	-4.38***
	(.565)	(.564)	(.586)	(.567)	(.564)	(.567)	(.563)	(.561)	(.589)
N	299	299	299	299	299	299	299	299	299
McFadden's R^2	0.339	0.344	0.353	0.365	0.339	0.346	0.339	0.339	0.342
Wald χ^2	96.999	97.307	94.416	97.579	96.562	98.830	98.270	97.242	94.510
BIC	-83.510	-85.468	-89.109	-94.072	-83.532	-86.294	-83.685	-83.300	-84.848

Notes: Dependent variable = Promotion to "A-Kader". Robust standard errors in parentheses. Marginal effects in italics. AMEs for traits are computed for male and female, respectively. †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A5 Probit model (Model 3)

	Coeff.	Std. Error	Margins
Big Five personality traits			
Male*EXTR	.0801	(.138)	*.0178*
Female*EXTR	.00491	(.157)	*.00109*
Male*AGRE	-.141	(.14)	*-.0313*
Female*AGRE	.0666	(.128)	*.0148*
Male*CONS	-.217[†]	(.12)	*-.0481*
Female*CONS	-.343[*]	(.145)	*-.076*
Male*NEUR	.316[†]	(.187)	*.0701*
Female*NEUR	.68[***]	(.175)	*.151*
Male*OPEN	-.0244	(.155)	*-.00541*
Female*OPEN	-.191	(.148)	*-.0425*
Self-evaluation			
Male*CSES	-.000217	(.184)	*-.0000481*
Female*CSES	.691[***]	(.192)	*.153*
Psychosocial			
Male*CAAS	.0402	(.169)	*.00892*
Female*CAAS	.118	(.158)	*.0261*
Cognitive			
Male*PIQ	-.00565	(.133)	*-.00125*
Female*PIQ	-.0686	(.123)	*-.0152*
Male*VIQ	-.149	(.166)	*-.033*
Female*VIQ	-.0682	(.131)	*-.0151*
Female dummy	.381[*]	(.187)	*.0818*
Participants' age	.0303	(.0198)	*.00691*
Recruitment age	.133[***]	(.0327)	*.0305*
DSH tenure	.201[***]	(.0301)	*.0459*
Migration	.622[*]	(.276)	*.142*
Team	.425[†]	(.223)	*.0972*
Retired	.28	(.316)	*.064*
Career break	-.0147[†]	(.00797)	*-.00337*
Constant	-5.42[***]	(.693)	
N	299		
McFadden's R^2	0.416		
Wald χ^2	108.766		

Notes: Dependent variable = Promotion to "A-Kader". Robust standard errors in parentheses. Marginal effects in italics. AMEs for traits are computed for male and female, respectively. †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A6 Probit model with CAAS subconstructs (Model 3)

	Coeff.	Std. Error	Margins
Big Five personality traits			
Male*EXTR	.168	(.168)	*.0348*
Female*EXTR	.0367	(.166)	*.00778*
Male*AGRE	-.155	(.151)	*-.032*
Female*AGRE	.0546	(.131)	*.0115*
Male*CONS	-.369**	(.142)	*-.0764*
Female*CONS	-.343*	(.15)	*-.0726*
Male*NEUR	.216	(.19)	*.0446*
Female*NEUR	.795***	(.195)	*.168*
Male*OPEN	.159	(.164)	*.033*
Female*OPEN	-.184	(.15)	*-.039*
Self-evaluation			
Male*CSES	-.0277	(.185)	*-.00572*
Female*CSES	.708***	(.2)	*.15*
Psychosocial			
Male*Concern	.373*	(.152)	*.0771*
Female*Concern	-.0763	(.17)	*-.0162*
Male*Control	-.0277	(.158)	*-.00572*
Female*Control	.238	(.177)	*.0504*
Male*Curiosity	-.487*	(.212)	*-.101*
Female*Curiosity	-.0839	(.195)	*-.0178*
Male*Confidence	.0369	(.152)	*.00763*
Female*Confidence	.0744	(.205)	*.0157*
Cognitive			
Male*PIQ	-.0713	(.127)	*-.0148*
Female*PIQ	-.0808	(.127)	*-.0171*
Male*VIQ	-.0755	(.172)	*-.0156*
Female*VIQ	-.0309	(.145)	*-.00653*
Female dummy	.374†	(.193)	*.073*
Participants' age	.0278	(.0201)	*.00606*
Recruitment age	.145***	(.033)	*.0317*
DSH tenure	.213***	(.0325)	*.0465*
Migration	.75*	(.307)	*.164*
Team	.536*	(.227)	*.117*
Retired	.326	(.334)	*.0712*
Career break	-.0147†	(.00778)	*-.00321*
Constant	-5.72***	(.692)	
N	299		
McFadden's R^2	0.442		
Wald χ^2	118.571		

Notes: Dependent variable = Promotion to "A-Kader". Robust standard errors in parentheses. Marginal effects in italics. AMEs for traits are computed for male and female, respectively. †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A7 Cox proportional hazards model (Model 1)

Model 1	*Big Five personality traits*					*Self-evaluation*	*Psychosocial*	*Cognitive*	
	EXTR	AGRE	CONS	NEUR	OPEN	CSES	CAAS	PIQ	VIQ
Female	1.57**	1.55*	1.51*	1.58**	1.56**	1.53*	1.56**	1.55**	1.53*
	(.266)	(.266)	(.258)	(.272)	(.268)	(.261)	(.267)	(.265)	(.265)
Trait	.975	.869	.766*	1.16	.995	.878	1.03	1.08	.913
	(.119)	(.114)	(.091)	(.146)	(.112)	(.115)	(.139)	(.129)	(.13)
Female*Trait	.913	1.18	1.17	.975	1	1.24	.954	.916	1.14
	(.154)	(.204)	(.18)	(.16)	(.159)	(.219)	(.167)	(.141)	(.215)
N	299	299	299	299	299	299	299	299	299
Pseudo R^2	0.006	0.006	0.009	0.008	0.006	0.007	0.006	0.006	0.006
Wald χ^2	9.199	7.550	12.201	9.107	6.709	7.730	6.929	7.323	7.150

Notes: Hazard ratios (HRs) estimates. Robust standard errors in parentheses; †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A8 Cox proportional hazards model (Model 2)

Model 2	*Big Five personality traits*					*Self-evaluation*	*Psychosocial*	*Cognitive*	
	EXTR	AGRE	CONS	NEUR	OPEN	CSES	CAAS	PIQ	VIQ
Female	1.65**	1.66**	1.63**	1.67**	1.65**	1.63**	1.67**	1.66**	1.68**
	(.299)	(.302)	(.295)	(.308)	(.301)	(.294)	(.302)	(.304)	(.306)
Trait	.95	.881	.704**	1.46**	1.11	.823	1.02	1.11	.792
	(.121)	(.133)	(.09)	(.2)	(.128)	(.104)	(.143)	(.155)	(.122)
Female*Trait	.96	1.11	1.23	.812	.847	1.36†	.933	.879	1.09
	(.176)	(.21)	(.203)	(.146)	(.143)	(.237)	(.179)	(.158)	(.206)
Recruitment age	.996	.99	.999	.986	.992	.989	.994	.988	.995
	(.0362)	(.035)	(.0375)	(.0347)	(.035)	(.036)	(.0357)	(.0355)	(.0349)
1970s cohort	.143***	.149***	.163**	.108***	.14***	.141***	.144***	.148***	.123**
	(.0827)	(.0829)	(.102)	(.0542)	(.0758)	(.0815)	(.0822)	(.0842)	(.0797)
1980s cohort	.355***	.347***	.356***	.349***	.329***	.326***	.348***	.342***	.366**
	(.109)	(.107)	(.111)	(.11)	(.102)	(.104)	(.108)	(.105)	(.113)
1990s cohort	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2000s cohort	.377***	.362***	.37***	.33***	.362***	.351***	.377***	.357***	.331***
	(.104)	(.0978)	(.104)	(.0916)	(.0986)	(.094)	(.106)	(.0972)	(.0915)
2010s cohort	.287***	.276***	.248***	.236***	.275***	.265***	.287***	.274***	.239***
	(.0878)	(.0826)	(.0793)	(.0745)	(.0824)	(.0793)	(.0874)	(.0832)	(.0748)
Migration	1.64†	1.59	1.62†	1.64†	1.77†	1.54	1.67†	1.68†	1.61†
	(.477)	(.464)	(.452)	(.44)	(.523)	(.456)	(.494)	(.513)	(.438)
Team	1.56*	1.55*	1.57*	1.73**	1.57*	1.65**	1.58*	1.56*	1.59*
	(.306)	(.304)	(.316)	(.335)	(.306)	(.315)	(.307)	(.305)	(.316)
Constant	.993	.993	.99	.992	.992	.993	.992	.993	.993
	(.00866)	(.00872)	(.00965)	(.00875)	(.0089)	(.00889)	(.00921)	(.00879)	(.00879)
N	299	299	299	299	299	299	299	299	299
Pseudo R^2	0.035	0.035	0.040	0.043	0.035	0.037	0.035	0.035	0.037
Wald χ^2	48.951	53.452	56.284	56.143	54.516	56.056	49.951	53.048	49.651

Notes: Hazard ratios (HRs) estimates. Robust standard errors in parentheses; †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A9 Cox proportional hazards model (Model 3 and 4)

	Model 3		Model 4 (Stratified Cox model)	
Female	1.74**	(.326)	-	-
EXTR	1.04	(.146)	1.03	(.174)
AGRE	.974	(.172)	.969	(.156)
CONS	.711*	(.116)	.701*	(.119)
NEUR	1.66***	(.25)	1.63**	(.273)
OPEN	1.06	(.165)	1.07	(.18)
CSES	1.19	(.218)	1.18	(.233)
CAAS	1.12	(.213)	1.12	(.212)
PIQ	1.09	(.164)	1.09	(.165)
VIQ	.801	(.142)	.768	(.129)
Female*EXTR	.941	(.229)	.944	(.23)
Female*AGRE	1.11	(.259)	1.12	(.251)
Female*CONS	1.09	(.245)	1.11	(.254)
Female*NEUR	1.03	(.23)	1.03	(.241)
Female*OPEN	.829	(.175)	.844	(.191)
Female*CSES	1.61†	(.397)	1.57†	(.426)
Female*CAAS	.852	(.208)	.871	(.21)
Female*PIQ	.77	(.156)	.774	(.158)
Female*VIQ	1.09	(.252)	1.13	(.244)
Recruitment age	.983	(.0362)	.975	(.0379)
1970s cohort	.083***	(.0513)	.0819***	(.0549)
1980s cohort	.255***	(.084)	.276***	(.0895)
1990s cohort	Ref.	-	Ref.	-
2000s cohort	.258***	(.0808)	.256***	(.0753)
2010s cohort	.148***	(.0495)	.143***	(.0468)
Migration	1.49	(.46)	1.5	(.499)
Team sports	2.03**	(.465)	2.01**	(.455)
Career break	.987	(.0107)	.987	(.00896)
N	299		299	
Pseudo R^2	0.062		0.066	
Wald χ^2	95.585		69.447	

Notes: Hazard ratios (HRs) estimates. Robust standard errors in parentheses; †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Table A10 Cox proportional hazards model with CAAS subconstructs (Model 3 and 4)

	Model 3		Model 4 (Stratified Cox model)	
Female	1.82**	(.352)	-	-
EXTR	1.04	(.166)	1.03	(.187)
AGRE	.963	(.151)	.962	(.147)
CONS	.58**	(.0975)	.557**	(.103)
NEUR	1.36†	(.223)	1.31	(.24)
OPEN	1.29	(.222)	1.31	(.24)
CSES	1.09	(.184)	1.07	(.22)
Concern	1.54**	(.224)	1.55**	(.246)
Control	1.11	(.218)	1.15	(.229)
Curiosity	.594*	(.127)	.573**	(.121)
Confidence	1.01	(.168)	1	(.189)
PIQ	1.01	(.153)	1.01	(.161)
VIQ	.936	(.191)	.898	(.168)
Female*EXTR	.936	(.24)	.938	(.237)
Female*AGRE	1.12	(.246)	1.12	(.246)
Female*CONS	1.33	(.302)	1.41	(.341)
Female*NEUR	1.32	(.326)	1.31	(.335)
Female*OPEN	.673†	(.162)	.688	(.169)
Female*CSES	1.81*	(.445)	1.77*	(.493)
Female*Concern	.608*	(.154)	.621*	(.145)
Female*Control	.947	(.254)	.902	(.243)
Female*Curiosity	1.63†	(.477)	1.72*	(.475)
Female*Confidence	.963	(.222)	.968	(.242)
Female*PIQ	.818	(.169)	.823	(.174)
Female*VIQ	.957	(.249)	.985	(.229)
Recruitment age	.978	(.0383)	.975	(.0396)
1970s cohort	.116***	(.0655)	.11**	(.0764)
1980s cohort	.253***	(.0863)	.27***	(.0897)
1990s cohort	Ref.	-	Ref.	-
2000s cohort	.298***	(.104)	.291***	(.0929)
2010s cohort	.168***	(.0615)	.161***	(.0538)
Migration	1.51	(.496)	1.53	(.529)
Team sports	2.39***	(.596)	2.34***	(.551)
Career break	.985	(.0113)	.985	(.00919)
N	299		299	
Pseudo R^2	0.071		0.078	
Wald χ^2	113.030		81.826	

Notes: Hazard ratios (HRs) estimates. Robust standard errors in parentheses; †, *, **, and *** represent statistical significance at the 10%, 5%, 1%, and 0.1% levels, respectively.