

ORIGINAL ARTICLE

Academics as Agentic Superheroes: Female academics' lack of fit with the agentic stereotype of success limits their career advancement

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Abstract

Gender gaps in academia persist with women being less likely to attain leadership, earning lower salaries, and receiving less research funding and resources compared to their male peers. The current research demonstrates yet another, more intangible gender gap in academia called lack of fit, whereby compared to male academics, female academics perceive higher misfit between their professional self-concept and the agentic 'superhero' stereotype of the successful academic. The entire population of Dutch academics (i.e., assistant, associate, and full professors from 14 universities) was approached to participate in a nationwide survey. Results from this unique dataset ($N = 3978$) demonstrate that academics perceive agency (e.g., self-confident, self-focused, competitive) as more descriptive of the stereotypical successful academic than communality (e.g., team-oriented, good teacher, collegial). Importantly, early career female academics perceived highest lack of fit with this narrowly-defined agentic occupational stereotype, which was correlated with lower work engagement, professional identification and career efficacy, and higher work exhaustion and exit intentions. Thus, lack of fit seems yet another barrier contributing to pervasive gender gaps in academia.

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Implications for building more inclusive academic cultures, where not only agentic but also communal academic practice is recognized and rewarded are discussed.

KEYWORDS

career advancement, gender inequality, lack of fit, occupational stereotypes, women in academia

INTRODUCTION

Worldwide, women are more educated today than at any point in history. In many Western countries, gender gaps in education are disappearing – at times even to the advantage of women (Centre for Global Development, 2019). However, the improved position of women in education does not translate to the workforce in academia. Gender inequality in academia persists, with female academics facing a number of gender gaps in their careers such as a *leadership gap* (women are vastly underrepresented at the full professor level; Higher Education Statistics Agency, 2013; LNVH, 2020), a *salary gap* (female academics earn significantly less; Brower & James, 2020; LNVH, 2016), a *funding gap* (female academics' success rates, funding amounts, and PI listings on research grants are significantly lower; Bedi et al., 2012; Witteman et al., 2019), and a *resources gap* (female academics report significantly less time, facilities, and assistance for research; LNVH, 2019). Over time, these gender gaps feed into the career stagnation and exit of women in academia (Ceci & Williams, 2011; Shen, 2013).

In the current research, we argue for a fifth, even more subtle gender gap in academia, namely a psychological *lack of fit* whereby, compared to male academics, female academics perceive themselves to fit less well with the agentic 'superhero' standard of the successful academic. We build from theory on social roles (e.g. Eagly, 1987; Eagly & Karau, 2002), social identity (e.g., Tajfel & Turner, 1979), and group stereotypes (e.g., Ellemers, 2018; Fiske et al., 2002) and lack of fit (e.g., Heilman, 1983, 2012), to demonstrate that (1) agentic – rather than communal – traits characterize the occupational stereotype of success in academia, (2) female academics' lack of fit between their professional self-image and the agentic occupational stereotype of success is higher than their male peers, and (3) female academics' higher lack of fit imposes a barrier to their work and career outcomes. We investigate this in a unique dataset of almost 4000 academics sampled from the entire Dutch population of assistant/associate/full professors at all 14 universities in the Netherlands.¹

This paper advances literature on lack of fit in several ways. While prior studies examined lack of fit mainly subjectively by directly asking women about their experienced fit with their profession (e.g., 'I see myself as quite different from [professional group]'; e.g., Morgenroth et al., 2021; Peters et al., 2012, 2013) we take a novel, socio-cognitive, and trait-based approach that allows for a more objective and indirect study of lack of fit (Judge & Cable, 1997). Specifically, we conceive of the self and an occupational prototype as two separate entities, and establish *lack of fit* based on the cognitive discrepancy between trait-ratings measured for the self and the prototype on stereotype-relevant domains (e.g., Otten & Epstude, 2006; Smith & Henry, 1996). Different from more explicit, subjective measures of lack of fit, cognitive lack of fit is not a motivated response and can be assessed even when people are not aware of subjectively experiencing a lack of fit, or are

¹The data reported in this manuscript was part of a larger project about working in academia. A subsample was previously published in 'Economisch Statistische Berichten', a non-scientific Dutch trade magazine for economic practitioners (Derks et al., 2018) and served a different purpose: namely to demonstrate that the occupational stereotype in Economics & Business was highly agentic compared to three other fields ($N = 2,256$) and that lack of fit was more prevalent. Note, that this publication did not investigate gendered consequences of lack of fit for work and career outcomes at different ranks, nor did it investigate the entire sample. This manuscript includes the full sample ($N = 3,978$; eight disciplines), explicitly focuses on gender differences in lack of fit in relation to work and career outcomes, and includes multiple covariates to control for a priori gender differences in Academic discipline (Simpson's Paradox), Academic age (linear and quadratic), Contract Size and Contract Type (Table S4).

unwilling to report this. Moreover, a cognitive approach to assessing lack of fit informs us about the specific content of the stereotype that people see, the way they see their professional self and how the discrepancy between these two components forms a cognitive basis for (lack of) self-concept fit. Furthermore, there is a clear theoretical and empirical evidence to show that people with high self-to-group cognitive fit are more likely to identify highly with a [professional] group and experience high collective self-esteem (see Integrated Model to Social Identification; Van Veelen et al., 2016). To our knowledge, we are the first to apply this socio-cognitive approach to lack of fit to advance psychological insight in gendered careers in academia.

Masculine culture and gender stereotypes in academia

Universities increasingly endorse the importance of having a (gender) diverse workforce, and numerous actions are taken to promote women's representation and career advancement in academia (League of European Research Universities, 2019). Yet, closing existing gender gaps is easier said than done. Across academic disciplines, gender discrimination, (sexual) harassment, and hostility towards female faculty is still prevalent and severely damaging women's well-being and academic careers (Crabtree & Shiel, 2019; Naezer et al., 2019; National Academy of Sciences, 2021). Female faculty are socially excluded or marginalized, for example from powerful social networks, from departmental decision-making bodies, and from support systems that stimulate career advancement (Casad et al., 2021; Collins & Steffen-Fluhr, 2019). Women in academia are also disproportionately burdened with time-consuming non-promotable tasks, for example higher teaching loads (Carrigan et al., 2011), more special favour requests from students (El-Alayli et al., 2018), and more service activities (Bagilhole, 2017; Belle et al., 2014). Finally, work-life balance policies in academia have been coined as highly 'family-unfriendly', with women – more than men – facing career penalties when having children (Cech & Blair-Loy, 2019; Kachchaf et al., 2015).

The often implicit yet pervasive gender stereotype that women 'do not have what it takes' and lack the agentic qualities (e.g., being independent and competitive) associated with scientific² ability forms a crucial mechanism to explain persistent gender inequalities in academia (e.g., Carli et al., 2016; Cheryan et al., 2015; Moss-Racusin et al., 2012). Children, parents, and teachers alike associate a prototypical scientist more easily with a man than with a woman (Bian et al., 2018; Storage et al., 2020). For example, asking 14-year-old children to 'draw a scientist' results in 75% of all drawings being portrayed as middle-aged White men (Miller et al., 2018). The same gendered associations hold for adults too (Miller et al., 2015). A large-scale study among 66 nations demonstrates that the more science ability is implicitly associated with men, the more pervasive the underrepresentation of women in academia within that nation. As a case in point, the Netherlands ranked 2nd place on this implicit *science women* stereotype, corresponding to a markedly high underrepresentation of women in science (Miller et al., 2015). Finally, academics themselves hold gendered notions about their profession too. Scientific ability is often seen as an innate, raw talent, a brilliance held more strongly by men than by women. The stronger academics endorse this gender stereotype, the stronger women's underrepresentation within that academic discipline (Leslie et al., 2015).

Despite mounting evidence disproving gender stereotypes about women's lower ability in science (Eagly et al., 2020; Ellemers, 2018; Hyde, 2014), academia is still viewed as a 'men's world', where men pre-dominate and in which men are believed to be more competent than women. Academics are thus likely to hold a highly 'masculine' stereotypical image of what it takes to be a successful professional in academia. Qualitative research shows that in constructing a prototypical image of 'academic excellence', leaders in academia (i.e., faculty deans) consider being self-confident, self-focused, competitive, and performance-oriented to be more important for success than being a team player, a nice colleague, a good teacher, and a collaborator (Bleijenbergh et al., 2013; Van den Brink & Benschop, 2012). And these ingredients of academic success fit with the current reward and promotion culture in academia, which is still largely based on individual performance-indicators such as the number and impact of

²The term science is not synonymous to the term academia. Science only includes the exact, natural, and social sciences, while academia includes all academic disciplines (including e.g., humanities, law). While the terms should not be conflated, the work on science stereotypes is relevant to our research on academia.

first-authored publications, H-indexes and acquisition of highly competitive personal research funds or awards, rather than teaching, mentoring, team science, and interdisciplinary collaboration (Ellemers, 2021; McKiernan et al., 2019).

Building on social role theory (Eagly, 1987; Eagly et al., 2000) and stereotype-content model (Fiske et al., 2002), we distinguish between two universal, yet gendered dimensions to construct an occupational stereotype of the successful academic professional, namely *agency* (e.g., achievement-oriented, competitive, self-focused, self-confident), which is typically associated with men or masculinity, and *communality* (e.g., relationship-oriented, kind, helpful, cooperative, concerned for others) which is typically associated with women and femininity (Cejka & Eagly, 1999; Eagly & Steffen, 1984; Koenig & Eagly, 2014). Given that academia is stereotyped as male or masculine, we expect academics to consider agentic traits more descriptive of the occupational stereotype of a successful academic relative to communal traits (Hypothesis 1).

Academics' professional self-descriptions

To the extent that the masculine culture in academia is likely to define career success in terms of an agentic rather than communal occupational stereotype, this should also inform our understanding of how this image of success is reflected in female and male academics' professional self-concept. Gender roles and stereotypes that portray women as *communal* and men as *agentic* are not only used to describe others, but they can also be internalized and become a part of a person's self-concept (e.g., Wood & Eagly, 2015). In early childhood, we learn about gender stereotypes and they inform us on how we should behave in accordance with our gender identity as boy or girl. These socializations generally lead men and women to self-describe in stereotype-congruent ways in their adult life (Spence & Buckner, 2000). In work contexts such as in academia, however, contemporary gender stereotypes that prescribe women to be communal are tied up with agency-based expectations that set the normative standard for professional success. This complicates women's professional self-descriptions, especially with regards to their self-views on agency (Hentschel et al., 2019).

In masculine work contexts, women must walk a tightrope (Williams & Dempsey, 2014), with on the one hand a gender identity that prescribes communality (i.e., warm, social), and on the other hand a professional identity that prescribes agency (i.e., competitive, self-focused). As a way of attaining career success while coping with a low-status gender identity at work, research on the Queen Bee phenomenon (e.g., Derks et al., 2016; Ellemers et al., 2004; Faniko et al., 2021) demonstrates that female academics at higher academic ranks tend to describe themselves more strongly in agentic terms than those at lower ranks. Similar patterns were found among male faculty too. Thus, we expect both male and female academics to rate their professional self as more agentic the higher their academic rank (i.e., assistant, associate, full professor; Hypothesis 2).

In addition, we explore (but have no a priori expectations on) whether communal self-descriptions are different depending on gender and rank. The aforementioned work on the Queen Bee phenomenon did not find that female academics' tendency to emphasize agentic traits coincided with lower communal self-descriptions. Nevertheless, we will explore female academics' communal self-descriptions depending on rank, given the various ways in which self-group distancing manifests across empirical studies (Van Veelen et al., 2020).

Not agentic enough? Lack of fit with the occupational stereotype in academia

Heilman's (1983, 2012) *lack of fit* framework explicates that the role expectations that portray men as agentic and women as communal cause gender bias and impose barriers for women to gain success in male-typed positions and occupations. To date, the lack of fit framework has been largely applied to

understand gender bias in female leadership from an *evaluator's* perspective (e.g., recruitment and selection processes; Heilman & Caleo, 2018; Heilman et al., 2015). Less empirical research has focused on a *target's* perspective. The current work adds to the knowledge base by taking such target perspective on female academics' lack of fit. The purpose is to show that lack of fit is not only something that *others* see and bias their views on women's suitability for promotion or leadership, but that it is also something that women *themselves* see and internalize in their self-concept. Lack of fit may thus act as a self-fulfilling prophecy (or 'self-limiting behaviors' as Heilman pointed to in 1983), in the sense that women themselves start to believe that a career in academia is not for them.

Environments that inhibit people's self-concept, thwart personal goals, or signal stigma in relation to group membership contribute to a lack of psychological fit. According to Schmader and Sedikides (2018), psychological fit comes in different forms, varying from state-like and motivational (*goal fit*) to more trait-like and cognitive (*self-concept fit*). With respect to the first, recent experiments show that motivating female college students to self-present in a masculine way (rather than a more gender-neutral way) to obtain a science laboratory position, undercut their sense of authenticity, and perceived fit to the position (Dormanen et al., 2020). Also, the higher women's self-reported feelings of lack of fit in a masculine occupational domain, the lower their career motivation and persistence (Peters et al., 2012, 2013). Different from this work, we focus on *cognitive self-concept fit*. Lack of self-concept fit occurs when there is incongruence between perceptions about chronically accessible aspects of the self-concept (e.g., who I am as a woman, as professional) relative to an entire work domain or context (e.g., the stereotype of the successful academic; Schmader & Sedikides, 2018; Van Veelen et al., 2016). We expect that the highly agentic occupational stereotype of the successful academic is more incongruent with the self-concept of women compared to men (cf., Eagly & Karau, 2002), thus resulting in higher cognitive lack of fit among female academics.

Lack of fit on agency is likely also more pronounced among assistant professors at lower ranks compared to full professors at the highest rank. The psychological distance between the current and the future professional self as portrayed by a highly agentic prototypical image of success is larger for those who have not yet obtained such success relative to those who embody that success (Peters et al., 2012). Therefore, we expect higher lack of fit between female academics' professional self-concept and the agentic stereotype of success compared to male academics, particularly at the lowest ranks (i.e., assistant professor; Hypothesis 3).

Consequences of lack of fit for work and career outcomes in academia

Female academics' higher lack of fit is expected to have negative consequences for work and career outcomes. Building from social identity theory (Tajfel & Turner, 1979), professional identification reflects the extent to which being an academic is a central part of the self-concept and provides a sense of self-definition and self-esteem (Ashforth et al., 2008; Ellemers et al., 2002; Haslam & Ellemers, 2005). The more cognitive overlap between the self and stereotypical group traits (i.e., more fit), the higher group members' identification (Latrofa et al., 2010; Van Veelen et al., 2016). However, group members who hold a minority or low-status position (such as women at lower ranks in academia), typically perceive themselves as less similar relative to stereotypical group standards, which can impede their sense of group belonging and self-esteem (Van Veelen et al., 2013). Therefore, to the extent that women's lack of fit with the agentic occupational stereotype is higher than men's, we expect this to lower professional identification, lower self-confidence as an academic (i.e. career efficacy; Hackett & Betz, 1981), and increase intentions to leave academia (i.e., career exit; Bentein et al., 2005).

In addition to the extent that women's lack of fit with the agentic occupational stereotype of success is higher than men's, this is likely to contribute to higher work exhaustion and lower work engagement (Schaufeli et al., 2002). For low-status group members (i.e., such as women in academia) not being able to be one's true self at work or having the feeling that one has to adjust to a male-dominant standard in order to 'fit in' is cognitively depleting, it lowers well-being (e.g., Bourguignon et al., 2020; Van Veelen

et al., 2020; Veldman et al., 2021), and it leaves less energy to actually invest in the work itself. Taken together, we hypothesize that female academics' higher lack of fit with the agentic stereotype of success (relative to men's) has negative consequences for work (i.e., work engagement and exhaustion) and career (i.e., professional identification, career efficacy, and career exit intentions) outcomes, particularly among female assistant professors (Hypothesis 4).

METHOD

Participants

In the academic year 2017/18, $N = 12,414$ academics from 14 Universities in the Netherlands were approached to participate in an online survey called 'Working in Academia'. A total of $N = 4295$ academics responded to the questionnaire (response rate of 35%). The following exclusion criteria were applied: (1) the participants who did not provide active informed consent or permission to use the data for scientific purposes (2) academics who did not fall in one of the academic ranks of Assistant Professor, Associate Professor, or Full Professor (e.g., PhD's or Post docs); (3) Academics who did not self-identify as man or woman, and (4) academics older than 67 years (retirement age in 2018, according to the Collective Labour Agreement of Dutch Universities). After applying the criteria, $N = 3,978$ participants remained in the dataset for further analyses (Table S1). See supplement on representativeness of the sample relative to the population.

The research had a cross-sectional design. The sample consisted of $n = 2363$ men (59%) and $n = 1615$ women (41%). In terms of academic rank, $n = 2034$ (51%) were Assistant Professor, $n = 877$ (22%) were Associate Professor, and $n = 1067$ (27%) were Full Professor. Signalling the leadership gap in academia, women were relatively overrepresented at the lowest academic rank, and underrepresented at the highest rank. Among women, 63% were Assistant Professor (relative to 43% of men), 20% were Associate Professor (relative to 23% of men), and 17% were Full Professor (relative to 34% of men).

Men in the sample were older ($M = 48.92$, $SD = 9.87$) than women ($M = 44.41$, $SD = 9.12$), $t(3900) = 14.45$, $p < .001$, also in terms of academic age (i.e., years since obtaining a PhD degree; $M_{\text{men}} = 17.02$, $SD = 9.27$; $M_{\text{women}} = 12.15$, $SD = 7.56$); $t(3833) = 17.19$, $p < .001$). Most academics (82%) held a permanent contract. Signalling their higher job insecurity, women (22%) more often held a fixed-term contract than men (16%). The vast majority (82%) of academics worked fulltime (36 h a week or more). Moreover, women more often held part-time contracts than men (26% of women compared to 13% of men). Finally, academics were categorized into one of eight academic disciplines based on the NARCIS-classification (Table S1). Female and male academics were not equally represented across disciplines: For example, within the group of women, most were employed in the Humanities (20%) and Behavioural Sciences (20%) while the least were employed in Economics and Business (7%). By contrast, within the group of men, most were employed in Natural Sciences and Technology (32%) while the least were employed in the Behavioural Sciences (7%).

Procedure

The study was approved by the Ethics Committee of the Faculty of Social and Behavioral Sciences of the university (FETC17-010). All academics in the relevant academic ranks (i.e., assistant/associate/full prof.) were approached via their university email address through internal HR communication systems. The invitation email was signed by either the Rector or HR-director of the university. The survey was available both in Dutch and in English and online for 2–3 weeks; after 1 week a reminder email was sent out. The participants first agreed to an informed consent form, ensuring amongst others, anonymity, voluntary nature of participation, safety of data storage, the right to withdraw, and contact information, followed by questions about demographic and job characteristics. Then,

questions about work circumstances were answered (e.g., time for research, availability of resources) as part of the larger project (LNVH, 2019). Finally, professional self-ratings and stereotype-ratings on the successful academic were measured, followed by questions about work well-being and future career in academia.

It took 15–20 min to complete the survey. Respondents did not receive a reward for their participation. Post hoc sensitivity analyses on the most comprehensive statistical model (i.e., H4) within the smallest subgroup (i.e., associate professors $N = 771$) indicated that the study was sufficiently powered to detect small effect sizes (e.g., Cohen's $f^2 \geq 0.013$; $\alpha = 0.05$, $1-\beta = 0.80$, Faul et al., 2009).

Measures

Agentic and communal attributions of the self and the occupational stereotype

The participants first rated their professional self and then the prototypical successful academic in their field on agentic and communal traits. Items to measure communal and agentic trait attributions were selected from pre-existing, validated scales (Abele, 2003; Bem, 1974; Cejka & Eagly, 1999) and adapted to the context of Dutch academia based on prior empirical research (Bleijenbergh et al., 2013; Van den Brink & Benschop, 2012³). All trait ratings were measured on a 5-point Likert-scale (1 = totally not applicable; 5 = totally applicable).

Seven items measured agentic trait-ratings (e.g., performance-oriented, self-confidence; $\alpha_{\text{self-rating}} = .72$; $\alpha_{\text{occupational stereotype}} = .79$) and seven items measured communal trait-ratings (e.g., being a pleasant colleague, being helpful; $\alpha_{\text{self-rating}} = .76$; $\alpha_{\text{occupational stereotype}} = .92$). Two CFA's on self- and stereotype ratings confirmed the validity of the 2-factor structure of the items (agency and communality) showing good model fit (Table S2). Mean scores were computed to construct four variables measuring self- and stereotype-attributions on agentic and communal traits.

Lack of fit index

To calculate a lack of fit index on agency, agentic self and stereotype trait-ratings were averaged into 2 mean composite scores. The mean score of agentic self-attributions was subtracted from stereotype-attributions (see Derks et al., 2011; Faniko et al., 2017 for similar approaches). Positive scores indicated that traits apply more strongly to the occupational stereotype than to the self, and vice versa for negative scores. The agentic lack of fit index ranged from -2.71 to 3.57 ($M = 0.69$, $SD = 0.76$) and the positive mean score indicated that academics generally considered themselves to be less agentic than the stereotypical successful academic, $t(3628) = 54.70$, $p < .001$, 95% CI_{95%} (0.663; 0.712).

Work and career outcomes

We measured work engagement (six items; $\alpha = .89$) and exhaustion (four items; $\alpha = .84$) based on Schaufeli et al. (2002). Furthermore, we measured professional identification (four items; $\alpha = .82$; Ellemers et al., 2002), career efficacy (three items; $\alpha = .67$; [Hackett & Betz, 1981]), and exit intentions (two items; $r[3616] = .693$, $p < .001$; adapted from Bentein et al., 2005). All items were measured on a 5-point Likert-type scale (1 = totally disagree; 5 = totally agree). A CFA on the 19 items in total confirmed

³We also consulted the competence profiles described in the job classification system (UFO) of the Association of Universities in the Netherlands (VSNU) at https://www.vsnul.nl/en_GB/job_classification_ufo.html and https://www.vsnul.nl/files/documenten/CAO/Koppe_ling_CINU_aan_UFO-profielen.pdf

the validity of the 5-factor structure showing good model fit (Table S3). Mean scores were computed to construct five variables.

Analytic strategy

SPSS 24 and MPLUS 8 statistical software programs were used for data-analyses. We used an α level of .05 (two-tailed) for all statistical tests. To adhere to ethical concerns, it was possible for the participants to not answer questions should they wish so. Answers to questions about gender (woman/man) and rank (assistant prof./associate prof./full prof.) were a prerequisite to be included for analyses. Yet due to its voluntary nature, we did deal with missing data on covariates and dependent variables (see Supplement on how we handled missing data). For inferential statistics, we included the covariates academic age (both linear and quadratic effects), academic discipline (seven dummy variables), contract type (fixed-term/permanent), and contract size (part-time/fulltime), to ensure that the statistical evidence for gender differences and interpretation of effect sizes could not be (partially) attributed to a priori gender differences in tenure, contract, or discipline (Simpson, 1951; Table S4).

To test H1-2, two repeated measures ANCOVA's were performed with gender (man/woman) and rank (assistant/associate/full professor) as between-subject factors, and trait domain (agentic/communal) about the occupational stereotype (H1) and the professional self (H2) as within-subject factor. To test H3, a two-way ANCOVA was performed on the lack of fit index on agency, with gender (man/woman) and rank (assistant/associate/full professor) as between-subject factors (Tables S5–S7 for ANCOVA Table H1-3⁴). To test Hypothesis 4, a multi-group path model was tested in MPLUS to investigate the indirect effect of gender on work and career outcomes *via* lack of fit. To test whether the consequences of lack of fit among female compared to male academics were moderated by rank, we applied multigroup modelling. Parameter estimates for the three ranks were thus estimated separately as with moderation analyses (See Table S8).

RESULTS

This research aims to empirically demonstrate cognitive lack of fit between academics' self-image and the agentic occupational stereotype of success, depending on gender (man/woman) and rank (assistant/associate/full professors), and to investigate consequences of lack of fit for work and career outcomes (See Table 1 for descriptive statistics and correlations).

Is the occupational stereotype of academic success more agentic than communal (Hypothesis 1)?

In support of H1, results showed that when asked to rate the stereotypical successful academic, regardless of their gender, academics emphasized agentic traits ($M = 4.230$, $SE = .011$) over communal traits ($M = 3.271$, $SE = .017$), $F(1,3611) = 63.221$, $p < .001$, $\eta_p^2 = .017$. As depicted in Figure 1 (Table S5), a significant interaction between trait domain (agency vs. communality) and rank, $F(2,3611) = 41.117$, $p < .001$, $\eta_p^2 = .022$ revealed that academics reported the occupational stereotype of success to be *more* agentic the lower their rank ($M_{\text{assist}} = 4.309$; $SE_{\text{assist}} = 0.015$; $M_{\text{associate}} = 4.240$, $SE_{\text{associate}} = 0.021$; $M_{\text{fullprof}} = 4.140$, $SE_{\text{fullprof}} = 0.023$), $F(2,3611) = 16.090$, $p < .001$, $\eta_p^2 = .009$. Conversely, academics re-

⁴Sample sizes across the six groups in the 2 (gender) \times 3 (rank) design were not equal. Checking ANOVA assumptions of normality and equality of variance across groups is thus important. Inspection of the data showed that *SD*'s across groups were largely similar and never exceeded the largest *SD* < 2*smallest *SD* rule. Graphical inspection of histograms showed that dependent variables were normally distributed.

TABLE 1 Descriptive statistics model variables

	<i>N</i>	<i>M</i>	<i>SD</i>	Pearson's <i>r</i>												
				1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Gender (0 = M; 1 = F)	3978	.41	.49	1	-.032*	-.182***	.101***	.030	-.028	.105***	.098***	-.034*	.128***	-.016	-.123***	.039*
Rank	3978															
2. F_D1 (assoc.)	.22	.41		1	-.322***	.011	-.037*	-.008	.014	.105	.017	-.056**	.019	.049**	.049**	-.071***
3. F_D2 (full)	.26	.44			1	-.079***	.123***	.178***	-.027	-.198***	.162***	-.144***	.133***	.278***	.278***	-.160***
4. Group stereotype	3631	4.24	.56			1	-.221***	.145***	.211***	.632***	.096***	.007	.122***	.017	.013	.013
Agentic																
5. Group stereotype	3631	3.23	.90				1	.238***	.169***	-.352***	.175***	-.067***	.121***	.183***	.183***	-.106***
communal																
6. Self agentic	3672	3.55	.59					1	.179***	-.675***	.353***	-.108***	.387***	.496***	.496***	-.099***
7. Self-communal	3672	4.20	.47						1	.018	.271***	-.058***	.105***	.159***	.159***	-.033*
8. Lack of fit agency	3629	.69	.76							1	-.207***	.092***	-.213***	-.376***	-.376***	.089***
9. Work engagement	3640	3.83	.69								1	-.544***	.324***	.454***	.454***	-.365***
10. Work exhaustion	3636	2.76	1.01									1	-.061***	-.268***	-.268***	.343***
11. Prof. identification	3625	3.71	.78										1	.423***	.423***	-.340
12. Career efficacy	3621	3.77	.67											1	1	-.329***
13. Career exit	3618	2.03	1.04													1

Mean's (*M*) Standard Deviation's (*SD*) and correlations (*Pearson's r*). M = male; F = female. F_D1 = Dummy variable with assistant professor as reference category (0) and associate professor as comparison group (1).

F_D2 = Dummy variable with assistant professor as reference category (0) and full professor as comparison group (1).

p* < .05; *p* < .01; ****p* < .001.

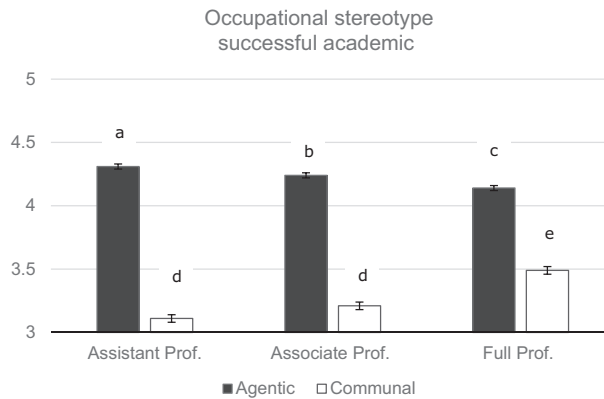


FIGURE 1 Occupational stereotype successful academic as function of trait domain and rank.

Note: Error bars represent Standard Errors (*SE*). Likert scale (1–5) was cropped from 3 onwards scale (3.0–5). Bars with different labels (e.g. a, b, c) indicate that pairwise comparisons (Sidak-adjusted) were significantly different at the $p < .050$ level, while no significant differences were observed for bars with the same label (e.g., d)

ported the occupational stereotype of success to be *less* communal at the lower ($M_{\text{assist}} = 3.111$, $SE_{\text{assist}} = 0.015$; $M_{\text{associate}} = 3.207$, $SE_{\text{associate}} = 0.034$) compared to the highest rank ($M_{\text{fullprof}} = 3.494$, $SE_{\text{fullprof}} = 0.036$), $F(2,3611) = 33.710$, $p < .001$, $\eta_p^2 = .018$.

Do academics' professional self-descriptions differ across gender and rank? (Hypothesis 2)

Second, in contrast to the occupational stereotype, academics described themselves to be more communal ($M = 4.195$; $SE = .009$) than agentic ($M = 3.604$, $SE = .011$), $F(1,3652) = 23.666$, $p < .001$, $\eta_p^2 = .006$. Confirming Hypothesis 2, both female and male academics described the self as *more* agentic with every step up in academic rank ($M_{\text{assist}} = 3.418$, $SE_{\text{assist}} = 0.015$; $M_{\text{associate}} = 3.586$, $SE_{\text{associate}} = 0.022$; $M_{\text{fullprof}} = 3.809$, $SE_{\text{fullprof}} = 0.023$), $F(2,3652) = 81.738$, $p < .001$, $\eta_p^2 = .043$. Conversely, academics described the self as significantly *less* communal at the highest ($M_{\text{fullprof}} = 4.152$; $SE_{\text{fullprof}} = 0.019$) compared to the lowest ($M_{\text{assist}} = 4.229$; $SE_{\text{assist}} = 0.015$) rank, $F(2,3652) = 4921$, $p = .007$, $\eta_p^2 = .003$, although this latter effect size was much smaller (Table S6).

The three-way interaction between trait domain (agentic/communal), gender (man v/woman), and rank (assistant vs. associate vs. full prof.) was also significant, $F(2,3652) = 5.665$, $p = .003$, $\eta_p^2 = .003$ (see Figure 2). Self-ascribed agency was higher with every step up in rank among both female, $F(2,1483) = 32.600$, $p < .001$, $\eta_p^2 = .042$, and male academics, $F(2,2156) = 51.267$, $p < .001$, $\eta_p^2 = .045$. However, while for male academics, self-ascribed communality did not differ depending on rank, $F(2,2156) = 0.41$, $p = .662$, $\eta_p^2 = .000$, for female academics, self-ascribed communality was lower at higher ranks, $M_{\text{assist}} = 4.291$, $SE_{\text{assist}} = 0.016$; $M_{\text{associate}} = 4.236$, $SE_{\text{associate}} = 0.028$; $M_{\text{fullprof}} = 4.150$, $SE_{\text{fullprof}} = 0.033$, $F(2,1483) = 6.215$, $p = .002$, $\eta_p^2 = .008$.

Examining contrasts between men and women at different academic ranks (Figure 2), we found that female assistant professors described themselves as more communal ($M = 4.264$, $SE = .016$) than their male peers ($M = 4.142$, $SE = .16$), $F(1,1877) = 27.878$, $p < .001$, $\eta_p^2 = .015$, while no significant gender differences were found for agentic self-ratings, $F(1,1877) = 1.322$, $p = .250$, $\eta_p^2 = .001$. A similar, yet less pronounced pattern of results was visible for associate professors. In contrast, female full professors described themselves as most agentic ($M = 4.206$; $SE = .030$) – even significantly more so than their male peers ($M = 3.795$; $SE = .037$), $F(1,966) = 4.264$, $p = .039$, $\eta_p^2 = .004$, while no significant gender differences were found for communal self-ratings, $F(1,966) = 1.283$, $p = .258$, $\eta_p^2 = .001$.



FIGURE 2 Professional self-ratings as a function of gender and rank.

Note: Error bars represent Standard Errors (*SE*). Likert scale (1–5) was cropped from 3 onwards scale (3.0–5). Bars with different labels indicate that pairwise comparisons (Sidak-adjusted) were significantly different at the $p < .050$ level, while no significant differences were observed for bars with the same. * Among associate professors, the gender difference in agentic self-description was marginally significant, such that female associate professors ($M = 3.597$; $SE = .035$) described themselves as slightly more agentic compared to their male peers ($M = 3.510$, $SE = .26$), $F(1,783) = 3.652$, $p = .056$, $\eta_p^2 = .005$

Do early career female academics experience most lack of fit with the agentic occupational stereotype? (Hypothesis 3)

Third, results from the ANCOVA showed that, after correction for the covariates, gender, and rank and their interaction term explained 8% of the variance in lack of fit on agency, $R^2 = .076$, $F(18,3610) = 16.55$, $p < .001$. As depicted in Figure 3 (Table S7), lack of fit was higher among academics at the lowest compared to the higher academic ranks. Assistant professors reported higher levels of lack of fit ($M = 0.89$, $SE = .02$), than associate professors ($M = 0.65$, $SE = .03$), and full professors ($M = 0.33$, $SE = .03$), $F(2,3610) = 103.47$, $p < .001$, $\eta_p^2 = .054$. In support for Hypothesis 3, on average, female academics re-

ported higher lack of fit ($M = 0.66$, $SE = .02$) than male academics ($M = 0.58$, $SE = .02$), $F(1,3610) = 7.038$, $p = .008$, $\eta_p^2 = .002$. This gender effect was moderated by rank $F(2, 3610) = 7.122$, $p = .001$, $\eta_p^2 = .004$,

such that the gender difference in lack of fit only manifested at the lowest rank (i.e., assistant professors). Specifically, confirming Hypothesis 3, female assistant professors reported the highest levels of lack of fit ($M = 0.99$, $SE = .03$) – significantly higher compared to male assistant professors ($M = 0.79$, $SE = .03$), $F(1,3610) = 34.74$, $p < .001$, $\eta_p^2 = .010$. No evidence for gender differences was found at the associate,

$F(1,3610) = 0.44$, $p = .507$, $\eta_p^2 = .000$, and full professor level, $F(1,3610) = 0.02$, $p = .887$, $\eta_p^2 = .000$).

Is lack of fit among early career female academics related to work and career outcomes? (Hypothesis 4)

A multi-group path model was tested to investigate the consequences of female (compared to male) academics' lack of fit for their work and career outcomes, moderated by academic rank. We built the conceptual model by modelling regression paths from gender (0 = men; 1 = women; IV) to the agency lack of fit index (M), and from lack of fit (M) to all DV's. The covariates were modelled both on the mediator and the dependent variables. The DV's were allowed to covary to control for multicollinearity. To investigate the direct paths in the model, standardized parameter estimates were interpreted.

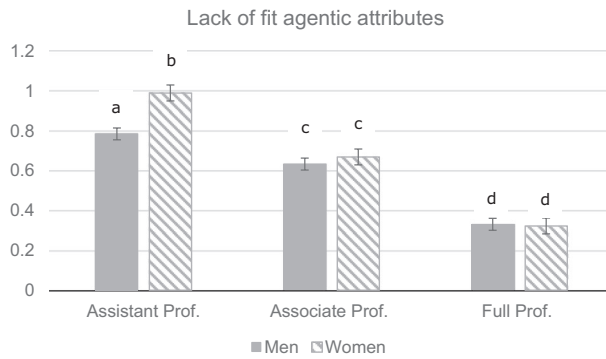


FIGURE 3 Lack of fit between the self and the agentic occupational stereotype as a function of gender and rank.

Note: Error bars represent Standard Errors (SE). Bars with different labels (e.g., a, b, c) indicate that means are significantly different at the $p < .050$ level, while no significant differences were observed for bars with the same (e.g., d) labels. The lack of fit index on the y-axis should be interpreted as occupational stereotype-ratings *minus* self-ratings on agentic attributes (i.e., perceiving the self as *less agentic* than the stereotype)

We tested indirect effects by generating 95% bootstrapped confidence intervals (CI_{95%}; 5000 iterations; MacKinnon et al., 2004; Shrout & Bolger, 2002).

First, the hypothesized multi-group path model (Model 1; Figure 4) yielded good model fit, $\chi^2(15) = 84.43$, $p < .001$, RMSEA = .062, SRMR = .007, CFI = .985, TLI = .697. Second, we tested whether multigroup modelling based on rank was justified, by comparing the model fit of the unconstrained multigroup model (Model 1), where the parameter estimates between the model variables were allowed to vary across ranks (1 = Assistant Prof.; 2 = Associate Prof., 3 = Full Prof.), to a model where the paths were constrained (i.e., where parameter estimates are held constant across rank, assuming that there are no differences between groups; Model 2). The constrained model, $\chi^2(183) = 313.25$, $p < .001$, yielded worse fit than the unconstrained model, $\Delta\chi^2(168) = 228.82$, $p = .001$. This indicated that the parameter estimates were significantly different across ranks and multigroup modelling was justified. To test Hypothesis 4, we thus interpreted the standardized parameter estimates for the unconstrained Model 1, and calculated Wald's difference test to determine which direct and indirect effects were significantly different across ranks (Table S8). The explained variance (R^2) per outcome variable at each academic rank is depicted in Figure 4. Note that for assistant professors, explained variance for all outcome measures was statistically significant, varying from small (2%) to medium (14%). For example, among assistant professors gender accounted for 6% of variance in lack of fit.

At all academic ranks, the higher academics' lack of fit with the agentic occupational stereotype the lower their reported work engagement, professional identification, and career confidence in academia (Figure 4). Moreover, specifically for assistant and associate professors, higher lack of fit resulted in higher levels of work exhaustion and a higher intention to leave academia. Confirming Hypothesis 4, only among early career assistant professors, the indirect effects from gender to work and career outcomes via lack of fit were significant. Namely, to the extent that female assistant professors' lack of fit was significantly higher than their male peers, this negatively affected their work and career outcomes. Only among assistant professors, higher lack of fit among women compared to men, resulted in women's significantly lower work engagement (*indirect effect*: = -.03, $SE = .006$, $p < .001$, CI 95% -.04/-.02), higher work exhaustion levels (*indirect effect*: = .01, $SE = .004$, $p = .004$, CI 95% .01/.02), lower professional identification (*indirect effect*: = -.03, $SE = .0046$, $p < .001$, CI 95% -.04/-.02), lower career efficacy (*indirect effect*: = -.05, $SE = .009$, $p < .001$, CI 95% -.07/-.03), and a higher intention to leave academia (*indirect effect*: = .01, $SE = .004$, $p = .015$, CI 95% .002/.02) relative to men's.

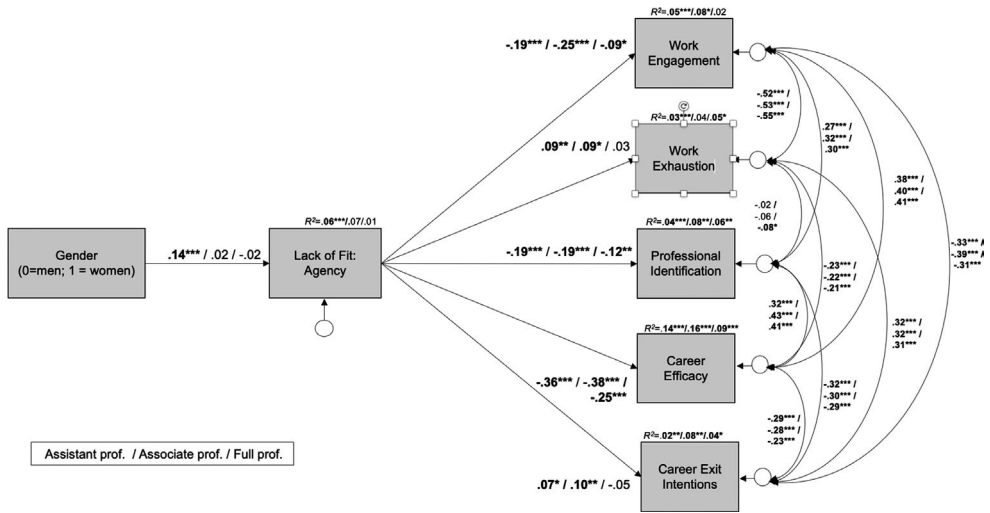


FIGURE 4 Multigroup path model on consequences lack of fit for male and female academics' work and career outcomes. *Note:* Standardized Parameter Estimates between model variables are displayed for Assistant/Associate/Full Professors separately. Estimates marked in bold are statistically significant at either *** $p < .001$, ** $p < .010$, * $p < .050$. Explained variance for dependent variables (R^2) per academic rank is depicted above the box

GENERAL DISCUSSION

The current research demonstrates that in academia, the subtle psychological process of cognitive lack of fit with a highly agentic 'superhero' standard of success (e.g., being self-confident, self-focused, and competitive) forms yet another gender gap that threatens career advancement in academia, particularly among women at an early career stage. Specifically, female (relative to male) assistant professors' higher lack of fit was related to lower work well-being, lower professional identification and career efficacy, and a stronger intention to leave academia. Lack of fit effects was found above and beyond a priori gender differences in academics' employment conditions. While effect sizes in our data were generally small, they do confirm the intangible and pervasive nature of gender bias, and its subtle manifestations in many areas in academia. Insights from this research are valuable and timely both theoretically, further unravelling the socio-cognitive barriers to professional identity formation among low-status groups (i.e., women in academia), and practically, given current debates on how academia's narrowly-defined, agentic culture of excellence breeds social inequality in academic careers (Ellemers, 2021; Woolston, 2021).

Our results showed that academics who embody career success themselves (i.e., full professors at the highest ranks), showed most fit between the self and the agentic occupational stereotype of success. In fact, female full professors considered themselves to be most agentic – significantly more so compared to their male peers and to those lower in rank. This confirms earlier demonstrations of Queen Bee behaviours, where self-portraying as highly agentic is considered a coping strategy for women leaders to be accepted in male-dominated high-status positions (e.g., Derks et al., 2016; Faniko et al., 2021). Stronger agentic self-descriptions at higher academic ranks could be either be due to processes of (*self*-)selection (i.e., the more agentic academics are, the more likely they are to receive (or apply for) a promotion) or socialization (i.e., academics learn that higher academic ranks require them to be more agentic), or both. Future longitudinal studies on women's academic career trajectories could shed more light on this.

Explorative analyses showed that for women, communal self-descriptions declined with every step up in academic rank – no such differences were observed for men. This may be a signal that apart from adhering to the agentic prototype of success, for women it may also require a distancing from communal

traits associated with one's gender identity to successfully climb the rungs of the academic career ladder. While Queen Bee literature so far has not shown a distancing effect on communal in-group traits among women in leadership (only an assertion towards agentic out-group traits), our findings are in line with literature on identity bifurcation and separation (Pronin et al., 2004; Von Hippel et al., 2011), suggesting that gender identity aspects that do not fit the academic context may be damaging and thus rejected as women gain academic success. We encourage further research on the social mobility responses of women in masculine work contexts, to gain a more dynamic understanding of tendencies to 'pull towards' the high-status group (i.e., I am *more* agentic) and to 'push away' a stigmatized group (i.e., I am *not as* communal; Van Veelen et al., 2020).

Our data also showed an interesting contrast effect: In their professional self-descriptions, academics indicated to be more communal than agentic, while they saw the occupational stereotypical of success as more agentic than communal. This contrast effect was particularly pronounced among early career assistant professors. We could speculate as to why we find this contrast effect. Perhaps it is due to selection bias, because the pro-social academics who were willing to fill out a survey voluntarily are more communal than agentic by nature. Or perhaps it is due to the items themselves, such that self-describing as 'collegial' and 'concerned for others' (i.e., communal) is more socially desirable than self-describing as 'self-focused' and 'competitive' (i.e., agentic), while such social desirability concerns do not apply for external attributions (e.g., occupational stereotype). But perhaps most convincingly to the context of this study – the observed contrasts in communal and agentic self- versus stereotype-ratings may be due to a mismatch in what, particularly early career academics perceive as the traits needed to actually do their job well (namely collaborating with others, exchanging knowledge with peers, students, and society) versus how they are currently rewarded and acknowledged for academic success (namely with self-focus and in competition with others; see Ellemers, 2021). Indeed, many academic systems and corresponding funding bodies do not yet sufficiently reward the collaborative nature of academic work.

Although correlational, our findings suggest that lack of fit with the agentic stereotype of academic success threatens the well-being and sustainability of careers of early-career academics, and particularly female assistant professors. Indeed, lack of fit is likely most detrimental when academics are still in a precarious and vulnerable position and when, particularly for women, 'doing things differently' than the agentic norm prescribes does not seem like a viable option in order to have a chance at full professorship (Kachchaf et al., 2015). Expanding this research to academics at even earlier career phases (i.e., PhD and post-doctoral researchers) is therefore important, because their position is even more precarious (OECD, 2021). Potentially, lack of fit is even higher and might have even more detrimental consequences for their career prospects in academia.

To date, many gender diversity initiatives to improve the position of women in academia take a targeted approach to empower women to better fit with the highly agentic and male-dominant culture. Skill trainings and network events are available specifically for women in academia to learn to better self-promote on their CV's, to become tougher negotiators, or to become more confident leaders. While often well-intentioned, such a 'fix the women' approach places the onus on women and makes them responsible for resolving gender inequality. Moreover, it perpetuates the idea that academic success is based on agentic qualities and promotes the stereotype that women 'cannot negotiate', 'need extra help' or 'should become more like men' in order to advance their careers. There is accumulating evidence that a women-only approach to foster gender diversity and equality is not only often ineffective, it can even result in backlash (Crosby et al., 2014; Unzueta et al., 2010). Rather than teaching women how to fit better with the current masculine standard of success in academia, the findings in our research advocate for a systemic change. This means to change the narrowly defined standard of success, and move towards a more inclusive academic culture in which not only agentic but also communal behaviours are recognized and rewarded.

Following the guidelines of the San Francisco Declaration of Research Assessment (DORA, 2020), public knowledge institutions in the Netherlands are reformulating the system of reward and recognition in academia, with the goal to broaden the scope of what 'academic excellence' means (VSNU, 2020; Woolston, 2021). In line with the current research findings, this change in reward and recognition

entails a move away from the highly agentic and narrow-focus on competitive research funding acquisition and number of first-authored publications, and a move towards inclusion of team science, teaching, academic leadership, and collaborative practice as evaluation criteria of academic success. We know that implicit bias causes agentic traits to be more likely recognized in male rather than female academics (Heilman, 2012; Koenig & Eagly, 2014). Adding to that knowledge base, female academics too are less likely to recognize themselves in that agentic standard of success than men do. A more inclusive definition of academic success will create more space for diversity. And not because male and female academics are inherently different, but because when we have a more inclusive picture of what it means to be successful in academia, implicit gender biases may have less impact on (self-)selection and promotion opportunities.

Broadening the standards of academic success means that multiple career paths can be chosen towards full professorship, which may ultimately result in more diverse role models and a more inclusive academy (Mitchneck et al., 2016). Such change towards an inclusive culture in academia would not only have the potential to increase women's career opportunities in academia, therewith closing existing gender gaps, but it also offers a more diverse set of career opportunities for men. Recent studies show that not only women, but men too may experience negative consequences of highly agentic work cultures. Specifically, in highly macho, masculine, or male-dominated working cultures (e.g., The Royal Army, Police, Medical Surgeons, High-Tech, Finance), when both women and men sense that they themselves are not agentic enough to adhere to the stereotypical standard of success, this is related to lower work engagement and belonging (Peters et al., 2015; Van Veelen et al., 2019). We see the same pattern of results in our data. While lack of fit is stronger for women compared to men, it was negatively related to work and career outcomes for both women and men. As such, a narrowly defined agentic view on academic excellence could mean that we do not only lose out on unique talent of (young) women, but also men (Ellemers, 2021; Nielsen et al., 2017).

A potential methodological limitation of the current research is that the data is cross-sectional (but see Spector, 2019). Yet, this approach exactly fits our study purposes – that is to efficiently and effectively reach a large population to disentangle complex relationships among psychological variables signalling gender gaps in academia. The data offers a snapshot of what a young generation of academics (assistant professors) currently sees as the benchmark for acquiring academic success (namely a highly agentic prototype). And they are right in their perception, because current exemplars of success (full professors) have indeed internalized the agentic prototype more than a younger generation does. This results in female (more than male) assistant professors experiencing psychological misfit in how current standards of success reflect their professional self-image, obstructing them from envisioning successful career advancement in academia. The covariates in our model rule out potential spurious relationships in this design (Table S4). Nevertheless, we do need to be cautious in making causal inferences. To this end, a longitudinal research or field experiments are recommended. For example, following early career academics during career transitions or monitoring the effectiveness of initiatives to make recognition and rewards standards more inclusive in academia.

This research was carried out in the Netherlands only. A strength of the data is its ecological validity – with a sample covering 33% of the entire target population, we can be confident that results are generalizable to the Dutch context. Also, since the Dutch academic system is representative of the Anglo-Saxon academic system in for example the United Kingdom and North-America, results are likely generalizable to these countries as well. Nevertheless, investigating differences in academic cultures cross-nationally and their consequences for (gender) diversity are recommended.

This research took a holistic approach to demonstrate a gender gap in lack of fit in agency, *above and beyond* potential differences academic discipline. A focus on academic subdisciplines was beyond the scope of the research goals, also because in terms of statistical power, sample sizes among female full professors would be too small to render reliable interpretation of interaction-terms with discipline. Nevertheless, we recognize that academic cultures differ across disciplines (Ceci et al., 2014; Derks et al., 2018). In future research, it is important to dive deeper into those subcultures and their connection to socio-psychological parameters of gender gaps in academia.

To conclude, this study sampled among the entire population of assistant/associate/full professors in the Netherlands, demonstrate that female early career academics show the highest cognitive lack of fit with the agentic 'superhero' stereotype of academic success. Our socio-cognitive approach to lack of fit forms yet another, subtle but pervasive gender gap that obstructs women's professional identity formation and career prospects in academia. Broadening the standards of academic success (including both agency and communality) and offering more diverse career trajectories towards full professorship, may ultimately result in a more (gender) inclusive academy.

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CONFLICTS OF INTEREST

All authors declare no conflict of interest.

AUTHOR CONTRIBUTION

Ruth Van Veelen: Conceptualization (equal); Data curation (equal); Formal analysis (equal); Investigation (equal); Methodology (equal); Project administration (equal); Resources (equal); Visualization (equal); Writing – original draft (equal); Writing – review & editing (equal). **Belle Derks:** Conceptualization (equal); Funding acquisition (equal); Methodology (equal); Project administration (equal); Supervision (equal); Writing – review & editing (equal).

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions, for example, containing information that could compromise the privacy of research participants. Therefore, only the principal investigators have access to the raw data files. The anonymized data to support the findings of this study are available upon reasonable request from the corresponding author. Additional Materials (e.g., Codebooks) and SPSS and MPLUS code and output for the analyses reported in this manuscript are available in a repository at the Open Science Framework: <https://osf.io/tjz4d/>

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

Supplementary Material

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