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Testing the motivational effects of attainable role models: Field and experimental evidence

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Abstract

The motivational theory of role modeling proposes motivational processes as critical mechanisms through which attainable role models can increase role aspirants' adoption of more ambitious goals. We conducted four studies to empirically test this proposition with role aspirants and their role models in field and experimental settings (total $N = 2,165$). Results provide empirical support for motivational processes of role modelling. Together they demonstrate that role models increase role aspirants' subjectively perceived probability of success (i.e., expectancy) and in turn motivation and goals, but only when they are perceived as attainable. These findings reveal how vital it is to raise the visibility of role models who embody representations of the possible and call for further research to understand *how* role models can reinforce expectancy by changing perceptions of one's own success, particularly the aspirations of minority group members.

1 | INTRODUCTION

Having examples of successful role models in fields where they are underrepresented (e.g., women in science, engineering or management) is a critical signal for members of minority and stigmatized groups that they can also succeed in such environments (Johnson et al., 2019). Indeed, role models have been shown to serve as a major determinant of role aspirants' behavior and expectations in any given role (Campbell & Wolbrecht, 2006; Gartzia & van Knippenberg, 2016; Paice et al., 2002; Stout et al., 2011). Yet, the role model literature has been somewhat vague in defining what a role model is and the specific mechanisms through which certain types of individuals are thought of as role models to motivate and inspire others (for open debates, see Betz & Sekaquaptewa, 2012; Dasgupta, 2011; McIntyre et al., 2011; Taylor et al., 2011). For instance, it is unclear whether contact need not be formal, sustained, or face-to-face to benefit from role models (Ko et al., 2019) or whether a close relationship more consistent with mentoring processes is necessary (Crosby, 1999; Downing et al., 2005; Gibson, 2004).

In general, a role model refers to an individual who serves as an example of the behavior associated with a specific role (e.g., doctor, political leader, manager; Merton, 1957). This approach does not provide definitional clarity on whether individuals thought of as role models can be anyone for whom a person could draw inspiration and who is seen as highly talented. Thus, questions remain about when role models are more or less effective. Role models are often presented as a potential way of inspiring members of underrepresented groups and thus serving as effective referents that can help overcome existing inequalities (e.g., Bosma et al., 2012; Dean, 2014; Peacock, 2012). For instance, there is evidence that raising the visibility of female role models for girls and women is vital to increase their own expectations of success, particularly in male-dominated fields (e.g., Bettinger & Long, 2005; Johnson et al., 2019; see also Nagengast et al., 2011, Plante et al., 2013; Wang, 2012). Yet, not all so-called role models are inspiring to everyone or inspiring but in different ways and for different people (Betz & Sekaquaptewa, 2012; McIntyre et al., 2011).

Importantly, our knowledge is particularly limited in relation to understanding *how* role models can influence role aspirants. Note

that "role aspirants" are individuals who choose role models based on their own values and goals (Morgenroth et al., 2015). In current globalized societies where information about highly successful individuals is easily available to the public and portrayed in media headlines (capturing achievements of successful women in one's own environment as well as more distant role models such as Nobel Prize winners in underrepresented fields; New York Times, 2020), a relevant question is whether and how role models can increase role aspirants' motivation to engage in such roles by activating subjective expectations of success (i.e., the underlying motivational process in role aspirants). While changes in role aspirants' goals and motivation are often seen as important outcomes of effective role modeling, the role model literature rarely draws on the motivational literature to understand this process. Also, it is unclear whether the effects that distant role models can produce extend to those of other more attainable referents such as teachers or mentors in one's field (see Bettinger & Long, 2005 for an analysis of how having female teachers in a course can influence female students' interest in such area).

Morgenroth and colleagues (2015) filled these gaps by proposing the motivational theory of role modeling, which introduced an analysis of the motivational processes of role aspirants by bringing together the role modelling literature and the expectancy–value models of motivation (e.g., Atkinson, 1957; Eccles, 1983; Eccles & Wigfield, 2002; Feather, 1982; Vroom, 1964, 1966). This theoretical approach argues, among other things, that an individual's goals, choices, and behaviors depend on that person's perceived subjective likelihood of success (i.e., expectancy) and the degree to which attainable role models influence these expectations of success. This approach diverges from mainstream approaches in the role model literature in that it emphasizes the psychological processes that occur on role aspirants' side, rather than focusing on the attributes that role models need to be effective. Consistent with this approach, some studies have pointed to identification with the domain or similarity between the self and role model as key factors to determine the extent to which aspirants are influenced by role models (e.g., Dasgupta & Asgari, 2004; Marx et al., 2009). Also, there is evidence that aspirants' perceptions and the types of attributions for role model success shape whether the role model is effective or not (Gartzia & van Knippenberg, 2016; McIntyre et al., 2011; Taylor et al., 2011).

Expectancy-value theories of motivation seem a particularly suitable explanation for these motivational effects of role models for a number of reasons. First, such theories are widely applied in achievement domains such as education and the workplace—the very domains in which role models have been shown to effectively change goals and motivation (Durik et al., 2015; Nagengast et al., 2011; Plante et al., 2013; Trautwein et al., 2012; Vroom, 1966; Wang & Degol, 2013). Second, expectancy-value theories have been used to predict outcomes that are also often studied in the role model literature, such as career and achievement goals (Nagengast et al., 2011; Plante et al., 2013; Shapira, 1976; Wang, 2012) and educational and occupational choices (Eccles et al., 1998). Finally, expectancy-value theories of motivation have been used successfully to explain the

effects of transformational leaders on followers (Shamir et al., 1993). Similar to role models, these leaders are inspirational others who can affect goals and motivation.

1.1 | Motivational processes of role modeling

Expectancy theories of motivation (e.g., Atkinson, 1957; Vroom, 1964; for an overview, see Eccles & Wigfield, 2002) provide a psychological understanding of how individuals are motivated to achieve particular goals based on their subjective goal expectancy and value (i.e., the extent to which an individual believes a goal can be reached the values said goal). This theoretical framework has been widely studied in several domains examining peoples' expectations of achievement, and has been supported by a variety of studies using both experimental designs (e.g., Maddux et al., 1986; Shapira, 1976) and field settings (e.g., Plante et al., 2013; Renko et al., 2012; Trautwein et al., 2012). More importantly, expectancy-value theories have proven useful in predicting several outcomes that are critical to the role modeling process, including behavioral intentions (Maddux et al., 1986; Meece et al., 1990), and career and achievement goals (Eccles et al., 1998; Nagengast et al., 2011; Plante et al., 2013). As such, they provide an interesting framework for understanding how role aspirants set their goals and the influence of role models in this process.

The concept of expectancy is particularly relevant. It refers to an individual's perceived subjective likelihood of success in a given domain, for example, the perceived likelihood of succeeding in a difficult task or role (Eccles & Wigfield, 2002). Expectancy can refer both to a short-term, specific goal (e.g., learning a complex mathematical formula) or long-term, broader goals (e.g., becoming a mathematical expert). As such, expectancy can be influenced by a wide range of factors, including internal processes related to perceptions about oneself and previous experiences in a role (e.g., perceived ability in math), but also external factors such as perceived success rates, or perception of discrimination, of one's own group in such a role (e.g., women's abilities in math). This subjective perception may be different from the actual likelihood of success, but it still influences behavior. Indeed, people feel more encouraged to engage in activities in which they experience or anticipate success, rather than failure (Salanova et al., 2011; Stajkovic & Luthans, 1998).

Drawing on this motivational literature, Morgenroth and colleagues (2015) theorized that role models may reinforce role aspirants' existing goals by increasing expectancy. Consistent with previous research (e.g., Fishbach & Ferguson, 2007), we conceptualize goals as cognitive structures that represent a desired outcome to which one is committed such as a desired career (e.g., to be a mathematician) or a more specific step in one's career path (e.g., to pass a relevant math exam; see also Erikson, 2007; Gartzia & Fetterolf, 2016; Markus & Nurius, 1986). Expectancy represents the motivational mechanism that subsequently directs behaviors toward the goal and, according to Morgenroth and colleagues (2015) the mechanism through which role models affect goals.

More specifically, the motivational theory of role modeling suggests that role models influence role aspirants' goals and motivation, in part, by being perceived as attainable (Morgenroth et al., 2015). In this way, perceiving a successful role model as attainable leads role aspirants to perceive such success as attainable for themselves (i.e., higher expectancy), resulting in a higher motivation to pursue this success. This idea is supported by evidence demonstrating that role models can have an impact on role aspirants' self-efficacy (e.g., Hoyt & Simon, 2011; see also Bandura, 1997) and by the large body of evidence from the expectancy-value literature showing the link between individuals' expectations of success and their motivation and goals (e.g., Eccles, 1983; Wang & Degol, 2013).

Researchers have suggested that certain types of individuals who are often thought of as role models (e.g., such as a Nobel Prize winner in STEEM or teachers) cannot be defined as such. For example, high school teachers often proposed as "role models" for underrepresented high school students (e.g., Evans, 1992; Gilmartin et al., 2006; Master et al., 2014), may only serve as inspiration for teaching, since they are not experts in STEM fields per se. Instead, older experts such as college faculty and industry professionals could be considered more motivating and inspiring to increase positive STEM attitudes (Stout et al., 2011), bolster feelings of fit in science (O'Brien et al., 2017), and increase motivation to learn science and improve science grades (Lin-Siegler et al., 2016). Yet, even these role models may not be optimally effective among all students given that these role models may not been seen as similar due to differences in other characteristics such as age, life experiences, or dressing. Perhaps it is not surprising then that most of the research demonstrating success with expert role models—both in STEM and at large—involve students who are at least college freshmen (e.g., Dasgupta & Asgari, 2004; Lockwood, 2006; Lockwood & Kunda, 1999; Marx et al., 2009; Robst et al., 1998; Stout et al., 2011; Tidball, 1985; Van Camp et al., 2019).

Lockwood and Kunda (1997) showed in a set of experimental studies with students, more distant models such as superstars can have an impact on the self if they excel at role aspirants' own domain of interest, increasing the likelihood of drawing an analogy between oneself and the role model. They demonstrated that superstars had an effect only when described as attainable, because attainable role models implicitly send the message that one still has enough time to achieve comparable success and abilities can improve over time. However, while these studies provide pioneering evidence for the suggested motivational effects role models can have, the evidence is limited to experimental scenarios and mediational effects of expectancy and thus cannot serve to test the motivational mechanisms proposed in the motivational theory of role modeling. Marx and Roman (2002) tested in three studies that female role models can buffer women's math test performance but the underlying mechanisms (mediation) was unclear.

We aim to respond to these gaps by examining the attainability-expectancy proposition of the motivational framework of role modeling, and examining how attainable role models may act as representations of the possible, motivating role aspirants to set and achieve their goals. In focusing on attainability we do not dismiss the relevance of other role model dimensions for which there is ample evidence, such as similarity (Brewer & Weber, 1994; Marx & Ko, 2012) or goal embodiment (see Morgenroth et al., 2015). However, we aim to illustrate that role models can only have positive effects on role aspirants' expectations of success when role models are perceived as representations of the possible, that is, when they are attainable. Across our studies, we test three hypotheses:

Hypothesis 1 *Role aspirants with attainable (vs. unattainable) role models will show stronger motivations to continue in their role.*

Hypothesis 2 *Role aspirants with attainable (vs. unattainable) role models will have higher expectations of success.*

Hypothesis 3 *The effect of role models on role aspirants' role intentions will be mediated by subjective expectations of success.*

1.2 | Overview of studies

We conducted four studies to test our hypotheses. In Study 1 we aimed to capture the basic mediating mechanisms of expectancy by asking academic staff members to indicate whether there they had role models in their career and then responding to items about expectations of success and motivations in relation to developing their career. In Study 2 we aimed to replicate these effects with academic staff members, refined measures of expectancy and with an explicit focus on attainable role models. In Study 3, we administered these same measures to a different type of role aspirants. Here we surveyed undergraduate students from a diverse range of disciplines thinking about attainable role models in their field, because role modelling effects can be particularly relevant for students and their aspirations for future life (Donaldson & Carter, 2005; Gartzia & Fetterolf, 2016; Jacobi, 1991). Finally, in Study 4, we tested these associations with a sample of PhD students, in an experimental design that allowed us to establish causality. We manipulated attainability of role models and examined its effects on PhD students' expectations of success and motivations in their academic career. Unique to Study 4, we also examined whether perceived desirability of role models had any moderating effects.

2 | STUDY 1

2.1 | Participants

Participants were 741 members of academic staff at a large research University in the UK (50.20% women, 49.80% men). The majority of participants worked in education and research (59.11%), followed by research only positions (24.20%), and education only positions (16.06%). Of these, 18.62% were early career (e.g., post-doctoral researchers, lecturers), 51.28% were mid-career (e.g., senior lecturer, associate professor), and 26.45% were senior (full professor). The remaining participants did not indicate

their career stage. Of those who indicated their age, 0.55% were 25 or younger, 25.94% were between 26 and 35, 38.97% between 36 and 45, 24.55% between 46 and 55, 9.02% between 56 and 65, and 0.97% over 65.

2.2 | Measures

The relevant questions were part of a larger survey on workplace experiences sent out to all university staff. Here, we report only the measures and results directly relevant to our research question, but the full materials can be found in the online Supporting Information.

We measured role models using two items: "I know of someone who has had a career that I want to pursue for myself" and "I have role models in my career" ($r = .59$). We measured expectancy using two items: "My future career looks bright" and "I think that I will achieve what I want to in my career" ($r = .65$). Lastly, we measured career demotivation using the items "I often think about pursuing a different career" and "I am less motivated in my work than I used to be" ($r = .43$). Participants responded to all items on 7-point scales from "strongly disagree" to "strongly agree".

2.3 | Results

Descriptive statistics and bivariate correlations can be found in Table 1. In line with Hypotheses 1 and 2, the availability of role models was positively associated with expectancy and negatively associated with demotivation. We then used the PROCESS macro for SPSS (V3, Model 4; Hayes, 2018) to test the hypothesis that role models would affect career demotivation through expectancy. In line with Hypothesis 3, we found a negative indirect effect $B = −.11$ [−.16, −.07],[1] while the direct effect was not significant (see Figure 1).

3 | STUDY 2

Study 1 demonstrated the expected mediating effects of expectancy to explain how role models influences motivational outcomes (e.g., career demotivation). However, the measures of expectancy in Study 1 showed relatively low reliability scores, including only two items. To overcome these limitations, Study 2 introduced a refined measure of expectancy and included variations of how role models can increase role aspirants' expectations of success. In particular, Study 2 evaluated more specifically the attainability of a role model's success, to directly test whether attainability is necessary to positively influence role aspirants' expectations. Note that attainability may be based on perceptions of psychological closeness to the role model (e.g., similarity in values or attributes, physical proximity, close relationship), but is not limited to such definitions.

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[1]Values in brackets refer to 95% confidence intervals.

TABLE 1 Descriptive statistics and bivariate correlations (Study 1)

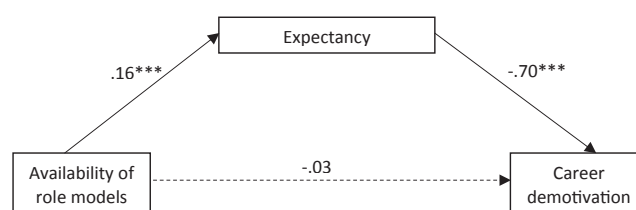|			Correlations	
	M	SD	2	3
1. Availability of role models	4.63	1.52	.20***	−.13**
2. Expectancy	4.18	1.19	–	−.51***
3. Career demotivation	3.52	1.64		–

***$p < .001$; **$p < .01$.

FIGURE 1 Indirect effect of the availability of role models on career demotivation (Study 1)

3.1 | Method

3.1.1 | Participants

A total of 416 academic staff members of a large research University in the UK took part in the study. Of these, 56.52% were identified as women, 43.00% were identified as male, and 0.48% were identified as falling outside of the gender binary. About half of participants indicated that they held an education and research role (50.48%), followed by research only roles (37.44%) and education only roles (12.08%). Of these, 55.31% of our sample were early career, 26.33 of our sample were mid-career, and 14.25% of our sample were senior. The average age of our sample was 39.14 ($SD = 10.25$).

3.1.2 | Measures

The measures presented here were part of a larger survey of workplace experiences. We report only the measures and analyses relevant to our research question, but the full materials can be found in the online Supporting Information.

We measured the availability of attainable role models using three items "Being like people who inspire me seems attainable", "There are people in my discipline that I think I can be like if I want to", and "I think that being like the successful people in my discipline seems unrealistic" (reverse coded; $\alpha = .77$). Expectancy was measured using three items "I am confident that I will achieve what I want to in my career, "I have the ability to overcome any obstacles to achieving success in my discipline", and "It is possible for me to achieve the goals that I have set for myself" ($\alpha = .80$). Lastly, career demotivation was measured using the two items "I am less motivated

TABLE 2 Descriptive statistics and bivariate correlations (Study 2)

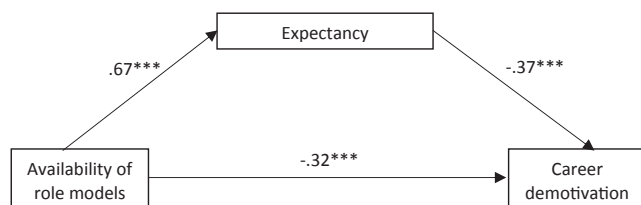|			Correlations	
	M	**SD**	**2**	**3**
1. Availability of attainable role models	4.60	1.20	.660***	−.403***
2. Expectancy	4.55	1.22	–	−.413***
3. Career demotivation	3.67	1.68		–

***p < .001.

FIGURE 2 Indirect effect of the availability of attainable role models on career demotivation (Study 2)

in my work than I used to be", and "I often think about pursuing a different career" (r = .51). Participants responded to all items on 7-point scales from "strongly disagree" to "strongly agree".

3.2 | Results

As can be seen from the descriptive statistics and bivariate correlations (Table 2), both Hypotheses 1 and 2 were supported: Having attainable role models was negatively associated with career demotivation (r = −.40), and positively associated with expectancy (r = .66). We then used the PROCESS macro for SPSS (V3, Model 4; Hayes, 2018) to test the mediating effects of Hypothesis 3. In line with predictions, there was a negative indirect effect B = −.25 [−.37, −.12] of the availability of attainable role models on career demotivation through expectancy such that participants who had attainable role models reported higher levels of expectancy and in turn lower levels of demotivation (or, put differently, higher levels of motivation). However, in contrast to Study 1, the direct effect was also significant, B = −.32 [−.49, −.16] (see Figure 2).

4 | STUDY 3

Study 3 was a replication of Study 2 using a different sample (undergraduate students) and with additional measures of role modelling outcomes. Students are a particularly interesting group of study to address questions future life aspirations (Bettinger & Long, 2005; Gartzia & Fetterolf, 2016). They also represent a social group where role modelling effects can be particularly relevant (Donaldson & Carter, 2005; Jacobi, 1991). Therefore, in Study 3 we measured the effects of attainable role models on students' future role intentions and plans in their studies.

4.1 | Method

4.1.1 | Participants

A total of 853 undergraduate students from a large British University participated. Of these, 56.52% identified as women, 43.00% identified as men, and 0.48% identified as outside of the binary. The largest group of students was in their first year of study (45.60%), followed by second year students (30.71%) and third year or beyond (23.45%). The students were diverse in terms of the disciplines they studied. The average age of our sample was 20.24 (SD = 3.53).

4.1.2 | Procedure and measures

Students received an e-mail from a senior person from within their discipline in which they were encouraged to take part in the study and provided with a link to the survey. Upon following the link, we gave students additional information about the survey and asked for their consent to participate. We first asked them to complete a short demographics section including gender, ethnicity, discipline, and year of study. We then asked them about various study experiences. Finally, we debriefed participants in full. The survey took approximately fifteen minutes to complete, and participants did not receive any compensation other than the chance to be entered into a raffle for gift vouchers.

Here, we only present the items relevant to our research question. The full materials can be found in the online Supporting Information. We presented all items in this survey as statements with which participants were asked to rate their agreement on a scale from 1 (strongly disagree) to 7 (strongly agree).

We measured availability of role models with the following items: "Being like certain people in my discipline seems attainable to me", "Being like the people in my discipline seems out of reach for me (reversed)", "There are people in my discipline who I think I can be like in the future if I want to" (α = .73).

We included three different measures of expectancy. First, we measured study expectancy, that is, the degree to which participants believed they could be successful in their studies: "I'm confident that I can successfully graduate from my studies", "I don't think I'm able to successfully finish my studies (reversed)", and "I don't see any obstacles to my success in my academic studies" (α = .71). Our other two measures of expectancy were directed towards a future career. We measured participants' career expectancy, that is, the degree to which they believed they could be successful in a future career in their discipline: "I think that I can find a job or get an advanced degree (e.g., MSc, PhD) in my discipline after I graduate", "Finding a job or getting an advanced degree (e.g., MSc, PhD) in my discipline would be hard for me (reversed)", and "I'm confident that I can stay in my discipline after I graduate" (α = .75). Lastly, we measured goal expectancy, that is, the degree to which they believed they would be able reach their personal goals in a career in their discipline using the items: "I think I can

TABLE 3 Descriptive statistics and bivariate correlations (Study 3)

			Correlations					
	M	*SD*	2	3	4	5	6	7
1. Availability of attainable role models	4.91	1.02	.43***	.45***	.45***	−.38***	.19***	.17***
2. Study expectancy	5.12	1.08	–	.47***	.29***	−.46***	.11**	.12**
3. Career expectancy	4.79	1.21		–	.62***	−.45***	.36***	.25***
4. Goal expectancy	5.02	1.20			–	−.49***	.59***	.29***
5. Study demotivation	3.11	1.52				–	−.29***	−.22***
6. Job intentions	5.18	1.57					–	.17***
7. Advanced degree intentions	4.09	1.98						–

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

achieve my career goals in my discipline", "I think a job in my discipline will give me the opportunity to reach my goals", and "I don't think my discipline is a place where I can achieve what is important to me" (α = .78).

We measured study demotivation using the items "I am less motivated in my studies than I used to be", "I sometimes think about dropping out of university", and "I often wish that I had studied something different" (α = .74). Lastly, we assessed two aspects of participants' career intentions using single-item measures, namely discipline related job intentions, "I am planning to look for a job related to my discipline when I graduate" and advanced degree intentions, "I am planning to study for an advanced degree (e.g., MSc, PhD) in my discipline".

4.2 | Results

Descriptive statistics and correlations between measures are displayed in Table 3. As can be seen, the availability of attainable role models was positively associated with all three forms of expectancy as well as both measures of career intentions, and negatively associated with study demotivation, supporting Hypotheses 1 and 2.

We then used the PROCESS macro for SPSS (V3, Model 4; Hayes, 2018) to test Hypothesis 3. We entered the availability of attainable role models as the predictor and all three forms of expectancy as parallel mediators. We ran this analysis three times, with study demotivation, job intentions, and advanced degree intentions as respective outcomes. For study demotivation, the indirect effects through study expectancy, *B* = −.18 [−.24, −.13], through career expectancy, *B* = −.06 [−.11, −.00], and through goal expectancy, *B* = −.21 [−.28, −.15], were all negative and significant, as predicted. The direct effect was also negative and significant, *B* = −.12 [−.22, −.02] (see Figure 3).

For job intentions, only the indirect effect through goal expectancy was positive and significant, *B* = .41 [.34, .49], supporting Hypothesis 3, while the indirect effect through career expectancy was non-significant, *B* = .03 [−.03, .08]. Contrary to predictions, the indirect effect through study expectancy was negative, *B* = −.05 [−.09, −.00], due to the fact that high study expectancy was
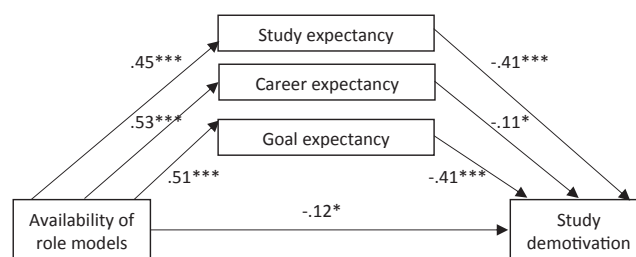

FIGURE 3 Indirect effect of the availability of attainable role models on study demotivation (Study 3)
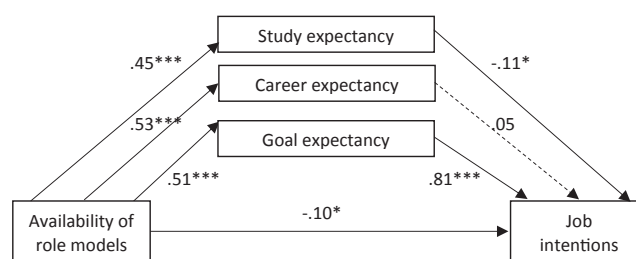

FIGURE 4 Indirect effect of the availability of attainable role models on job intentions (Study 3)
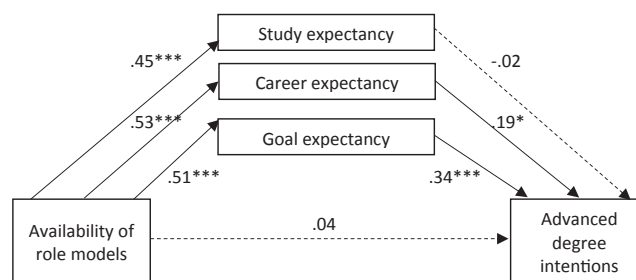

FIGURE 5 Indirect effect of the availability of attainable role models on advanced degree intentions (Study 3)

negatively related to job intentions, *B* = −.11 [−.20, −.01]. The direct effect was also negative, *B* = −.10 [−.21, −.00] (see Figure 4).

Lastly, for advanced career intentions, we found a positive indirect effects through career expectancy, *B* = .10 [.01, .19], as well as goal expectancy, *B* = .17 [.09, .26], supporting Hypothesis 3. Neither

the indirect effect through study expectancy, $B = -.01$ [$-.08$, .06], nor the direct effect, $B = .04$ [$-.11$, .20], were significant (see Figure 5).

5 | STUDY 4

The results of Study 3 supported our hypotheses that the attainability of role models would affect students' role outcomes and that expectancy would mediate this association. Despite this field-based support, Studies 1–3 are limited by their correlational nature. Our goal in Study 4 was to test these relationships with an experimental design that better allows us to address causality. The motivational theory of role modelling suggests that role models' features beyond attainability also account for differences in students' career intentions (Morgenroth et al., 2015). For example, desirability or "the degree to which a role aspirant perceives a role model in a positive light" (p. 12) may also influence role-modeling outcomes. Therefore, we additionally tested potential moderating effects of desirability of role models. We expected that high attainability and high desirability would interactively and positively operate to increase PhD students' career intentions.

5.1 | Participants

Participants were 155 full-time PhD students from science disciplines across three British universities. They were recruited by e-mailing all PhD students in science disciplines whose e-mail addresses were available from the university websites. Of the 796 PhD students we contacted, 164 took part in the study. We excluded nine participants who were undertaking their PhD part-time. We consider this sample size sufficient for our study, as an a priori power analysis carried out using GPower (Faul et al., 2009) demonstrated we would need a sample size of 128 to have 80% power to detect medium size effects in our primary analysis (a 2 × 2 ANOVA). The final sample size was thus 155, 44.52% of which were women and 55.58% were men. The average age of participants was 28 years ($SD = 6$ years).

5.2 | Material and design

Participants received an email that included a random-assigned link to one of four versions of the study: 2 (Attainability: High vs. Low) × 2 (Desirability: High vs. Low). To reduce potential confounding effects and because only a limited number of studies have focused on role modelling effects of female role models as general representations of success, we choose to present male and female participants with female role models only. Although group membership in terms of gender may influence role modelling processes and vary depending on the stereotypical content of the domain (e.g., Gartzia & Baniandrés, 2019; Marx & Roman, 2002), previous research also suggests that female role models can work equally well

for male and female role aspirants (Lockwood, 2006). We did not expect any effects of participant gender but controlled for its effects in analyses.

After providing demographic details, participants read information about a (fictional) female post-doctoral researcher at their university called Elizabeth Pearce. They first read about her academic career, which was described either as being extremely exceptional (low attainability) or as excellent, but not exceptional (high attainability, keeping in mind the high standard of PhD students). We manipulated this at all stages of her educational path, from school, to her undergraduate studies, to her PhD. For example, the low attainability condition contained the following statement from her undergraduate lecturer: "I've never seen an undergraduate student produce such high quality work." In the high attainability condition we altered the statement to "It's rare to see an undergraduate student produce such high quality work" (see online Supporting Information for more information).

Next, to manipulate desirability, we presented participants with statements from three people describing their personality. As communality is a likely predictor of desirability, and as both the stereotype content model (Fiske et al., 2002) and social role theory (Eagly, 1987) further suggest that this would be particularly the case for women, she was either described as communal by using traits such as humble and considerate (high desirability) or not particularly communal by describing her in a manner that made her appear arrogant and blunt (low desirability). For example, in the high desirability condition her mother said about her: "She never had trouble making friends... even though she was smarter than the other kids she never showed off." In the low desirability condition, her mother noted: "She had some trouble making friends some time... she just knew she was smarter than the other kids and wasn't afraid to show it." We held attributes speaking to her competence and morality (e.g., intelligent and honest) constant. After responding to the dependent variables described below, we fully debriefed participants.

5.3 | Measures

After reading about the potential role model we included manipulations checks: three items in relation to perceived desirability (e.g., "How much do you want to be like Elizabeth Pearce?"; $\alpha = .82$) as well as two items about perceived attainability (e.g., "How much do you think you can be like Elizabeth Pearce?"; $\rho = .74$). We asked these questions on seven-point scales from 1 = "not at all" to 7 = "very much".

Next, participants indicated their agreement with statements about themselves on a seven-point scale from 1 = "strongly disagree" to 7 = "strongly agree". These included three items about their expectations of their future success in academia (e.g., "I am confident that I have a good chance in succeeding in academia after my PhD in comparison to my peers."; $\alpha = .79$) and three statements about academic career intentions (e.g., "I will try to stay in academia after I finished my PhD."; $\alpha = .82$).

6 | RESULTS

Initial analyses, 2 (Attainability: High vs. Low) × 2 (Desirability: High vs. Low) × 2 (Participant gender: Male vs. Female) ANOVAs, where we included gender for exploratory reasons, revealed that our manipulations of attainability and desirability were successful. Participants in the low attainability condition perceived the potential role model as less attainable ($M = 4.16$; $SD = 1.46$) than those in the high attainability condition ($M = 4.66$; $SD = 1.32$) $F(1, 146) = 4.17$; $p = .043$; $\eta^2 = .03$. The desirability manipulation did not influence attainability by itself $F(1, 146) = 0.94$; $p > .250$; $\eta^2 < .01$ nor did it interact with attainability $F(1, 146) = 2.06$; $p = .154$; $\eta^2 = .01$. Those in the low desirability condition ($M = 3.56$; $SD = 1.02$) reported less desire to be like the potential role model than those in the high desirability condition ($M = 4.77$; $SD = 1.28$) $F(1, 147) = 41.80$; $p < .001$; $\eta^2 = .22$. The attainability manipulation did neither affect perceived desirability $F(1, 147) = 0.38$; $p > .250$; $\eta^2 < .01$ nor interact with desirability $F(1, 147) < .01$; $p > .250$; $\eta^2 < .01$. Gender of participant did not influence perceived attainability or desirability nor did it interact with the desirability or attainability manipulations (all $F < 1.48$; all $p > .225$). Thus, we did not include participant gender in any further analyses.

With regards to academic career intentions we found a significant main effect for attainability, supporting Hypothesis 1. Those in the high attainability condition reported greater intentions to pursue a career in academia ($M = 5.38$; $SD = 1.38$) compared to those in the low attainability condition ($M = 4.63$; $SD = 1.64$) $F(1, 151) = 9.40$; $p = .003$; $\eta^2 = .06$. Desirability did not affect career intentions, $F(1, 151) = 1.57$; $p = .213$; $\eta^2 = .01$, and did not interact with attainability, $F(1, 151) = 2.51$; $p = .115$; $\eta^2 = .02$.

We then conducted a 2 (Attainability: Low vs. High) × 2 (Desirability: Low vs. High) ANOVA to investigate how these variables influenced expectations of success. In line with Hypothesis 2, results demonstrated a significant effect of attainability. Those exposed to the highly attainable role model expressed higher expectations of success ($M = 5.11$; $SD = 1.06$) than those exposed to the less attainable potential role model ($M = 4.60$; $SD = 1.35$) $F(1, 151) = 6.55$; $p = .011$; $\eta^2 = .04$. Desirability did not influence expectations of success either on its own, $F(1, 151) = .42$; $p > .250$; $\eta^2 < .01$ nor in interaction with attainability, $F(1, 151) = .01$; $p > .250$; $\eta^2 < .01$.

Next, we tested Hypothesis 3 by investigating whether attainability affected career intentions by changing expectations of success and, once more, whether its potential direct effect depended on levels of desirability. We used the PROCESS macro for SPSS (Hayes, 2018; V3, Model 5). We coded attainability so that 0 refers to the low attainability

condition, while 1 refers to the high attainability condition. Similarly, we coded desirability so that 0 refers to the low desirability condition and 1 refers to the high desirability condition.

First, we found that, in line with the ANOVA results reported above, attainability did indeed influence expectations of success $B = .50$ [.12, .89] such that those in the high attainability condition reported higher expectations of success compared to those in the low attainability condition. In line with Hypothesis 3, we further found an indirect effect of attainability on career intentions through expectations of success $B = .26$ [.07, .53]. Thus, as predicted, those exposed to a more attainable role model had higher expectations of success, which in turn lead to higher academic career intentions (see Figure 6).

As can be seen in Table 4, the interaction between attainability and desirability was not statistically significant. Based on previous discussions about marginal significance of interaction terms (Ziliak & McCloskey, 2009), we examined the conditional direct effect of attainability more closely and found that the direct effect of attainability was not significant when desirability was low $B = .09$ [−.54, .73] but the effect was positive when desirability was high $B = .89$ [.27, 1.51]. Thus, the effect that attainability had on career intentions, not mediated by expectations of success, depended on levels of desirability. When desirability was low, levels of attainability did not matter, but when it was high, higher attainability lead to higher career intentions.

7 | GENERAL DISCUSSION

In any role modelling dynamic, role aspirants experience a number of psychological processes that determine their future success in a given role. Yet, very little research has addressed the role of

TABLE 4 Results of the mediation analysis predicting academic career intentions (Study 4)

	B	B SE	LLCI	ULCI
Attainability	.09	.32	−0.54	0.73
Desirability	−.03	.31	−0.64	0.58
Expectations of success	.51**	.09	0.32	0.69
Attainability × Desirability	.79†	.45	−0.09	1.68

Note: $R^2 = .24$; B refers to unstandardized coefficient.
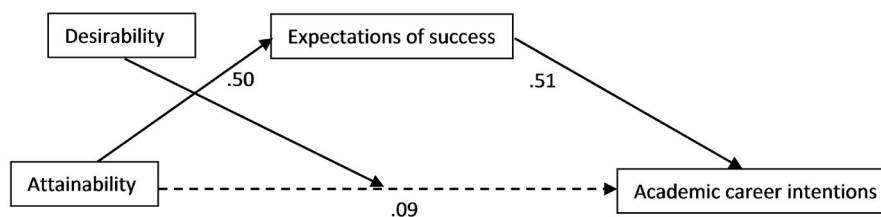
**$p < .01$

†$p < .10$.

FIGURE 6 Results from conditional process analysis predicting academic career intentions (Study 4)

expectancy in these functions nor has research examined how the characteristics that role models themselves need to possess to be effective (i.e., attainability and desirability) affects motivational processes and, in turn, goals. Our findings address these gaps and provide the first experimental support for the motivational theory of role modeling (Morgenroth et al., 2015). Together they provide field and experimental evidence that role models contribute to career goals and motivation by increasing expectancy. At the same time, results showed that role models need to be seen as attainable to produce such role modelling effects.

These patterns suggest that aspirants' motives and psychology play a critical role in role modelling processes in combination with role models' features. This approach provides an interesting empirical counterpoint to the assumed idea that role models are influential to the extent that they represent successful examples of behavior (Nagengast et al., 2011; Plante et al., 2013; Wang, 2012). The current findings suggest that the benefits of role modelling processes are limited when individual motives are not activated (i.e., the inner expectancy motivational dimension) because role models are perceived to be out of reach. It could be that, regardless of how successful role models are (e.g., politicians, top managers/CEOs, or Nobel Prize winners), role modelling processes are limited to situations where role models are perceived as attainable and thus are able to activate role aspirants' motivational responses. Examples of attainable role models may include proximal referents based on perceptions of psychological closeness, physical proximity, or close relationship (e.g., a teacher, a mentor, a parent, a friend, a family member). Future research measuring the effects of these dissimilar role models in combination with role aspirants' motivational responses would enhance our understanding concerning the multiple ways in which role modelling processes occur.

In Study 4, we explored whether other dimensions of role models (i.e., desirability) influenced these effects. We observed a partial effect of desirability on strengthening PhD students' career intentions—an attainable role model proved to be more effective than a role model who was desirable but not attainable. The mediating effect of attainability on expectancy emerged when desirability was high, but when desirability was low levels of attainability did not matter. These findings suggest that desirability could be a necessary but not sufficient condition for the potential subsequent impact that attainability can have on subjective expectations of success. As Morgenroth and colleagues (2015) explained, role models need to be perceived as desirable to activate psychological processes like identification or admiration, and, at the same time, this is likely to be influenced by issues of proximity such as shared group membership (e.g., Dasgupta, 2011; Gartzia & Van Knippenberg, 2016; Lockwood, 2006). This opens the question of whether and how effects may vary when researchers are investigating mentoring processes that occur among peer role models (i.e., who are successful in demonstrating potential attainable talent in a given domain) or role models more broadly (i.e., in terms of anyone for whom a person could draw inspiration and who is seen as highly talented).

As implied by Bandura's (1997) conceptualization, self-efficacy in a given role can be influenced by external perceptions such as stereotypes about a given role or social group (see Turner et al., 1994). To the extent that a role is particularly stereotyped and opposed to one's social identity (e.g., women in math, chemistry or management), expectancy beliefs may be more clearly influenced by general beliefs about the probabilities of success of that given group (e.g., "Because I am a woman and women lack mathematical skills, I will never be a successful mathematician"). Likewise, expectancy beliefs about the probabilities of success and its connections to attainability may vary depending on the specific content of a role and its stereotypical nature. For instance, future research may test whether the weaker effects of a distant referent such as a female Nobel prize winner in role modeling processes compared to a more proximal, realistic referent may vary across roles (e.g., effects may be stronger in relation to stereotyped roles such as women in chemistry than in relation to other roles like women in education).

At an applied level, the relevant function of motivating individuals to perform new behaviors and inspire them promoted by attainable role models' can help role aspirants develop more ambitious goals. This function can be especially relevant for members of underrepresented and stigmatized groups. For instance, role models can be particularly relevant in educational and occupational settings where role aspirants can increase their perceived probability of success based on role models' behavior, resulting in lower inequalities (see also Bosma at al., 2012; Dean, 2014; Peacock, 2012). Yet, note that as we mentioned belonging to a given social group that is similar to that of a role model (e.g., women) may also determine the extent to which the attainability-expectancy association emerges and lead to higher role intentions. Future studies looking at these intersections between role models' and role aspirants' features, as well as contextual influences, may be valuable.

Finally, note that the associations between attainability, expectations, and role intentions that we observed in the current work may also vary depending on the level of stigma placed on a given specific role and its congruence with role aspirants' own social role perceptions. As Rudman and Phelan (2010) showed, women's self-stereotyping (i.e., the degree to which they saw themselves as stereotypical women) decreased interest in male-dominated occupations such as surgery (see also Asgari et al., 2012; Stout et al., 2011). Also, stigmas about the relevance of certain traits in a role (e.g., agentic features in leadership) can reduce role intentions from individuals with different features (e.g., women with communal orientations; Eagly, 1987; Gartzia & Baniandrés, 2016; Salanova et al., 2011). Future research should thus look into this question in relation to stigma and different role identities (e.g., male vs. female as well as role models with different age, nationality, race, group or status). Also, future research could investigate the effects of other role model dimensions like goal embodiment, as well as the role that personal values and interests can play in shaping career intentions (Morgenroth et al., 2015).

8 | CONCLUSIONS

We have demonstrated that role aspirants benefit from role models who are attainable by increasing role aspirants' expectancy. In doing so, we provide a first empirical test of the motivational theory of role modeling and therefore add to our current understanding of the factors that encourage or discourage effectiveness of role modelling functions in role aspirants. This has important implications for those who wish to use role models to inspire specific and potentially disadvantaged groups (such as women in male-dominated fields). Contrasting intuitive notions of the multiple possible ways in which highly successful individuals such as politicians or Nobel Prize winners should influence role aspirants and minority group members, it might not be enough to see a few excelling individuals to activate role modelling motivational processes. Rather, role aspirants need role models who they see as both desirable and attainable and who demonstrate that success is not out of their reach.

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