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The Impact of Middle Names:

Middle Name Initials Enhance Evaluations of Intellectual Performance

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### Abstract

Middle name initials often appear in formal contexts, especially when people refer to intellectual achievements. Based on this common link, the display of middle initials increases positive evaluations of people's intellectual capacities and achievements. We document this effect in seven studies: Middle initials in authors' names increased the evaluation of their writing performance (Study 1), and middle initials increased perceptions of status (Studies 2 & 4). Moreover, the middle initial effect was specific to intellectual performance (Studies 3 & 6), and it was mediated by perceived status (Studies 5, 6, & 7). Besides supporting our hypotheses, the results of the studies yield important implication for everyday life.

*Keywords:* middle initials, names, inference, status, person perception, impression formation

### The Impact of Middle Names:

#### Middle Name Initials Enhance Evaluations of Intellectual Performance

Names and their display have a potent effect on people's judgments and life. For example, in academic domains in which authors are often listed alphabetically (e.g., economics), those with surnames early in the alphabet are more likely to be recipients of, for example, the Nobel Prize (Einav & Yarovitz, 2006) and they have better reputations, possibly due to the higher visibility of their names (Efthymiou, 2008). Further, own name's letters are more positively regarded compared to other letters (Nuttin, 1985; 1987; see also Kitayama & Karasawa, 1997; Koole, Dijksterhuis, & Knippenberg, 2001; Pelham, Mirenberg, & Jones, 2002; cf. Simonsohn, 2011). Moreover, people with initials carrying a positive meaning (e.g., 'H. U. G.') *live* longer compared to when initials carry a negative meaning (e.g., 'M. A. D.'; Christenfeld, Phillips, & Glynn, 1999). In sum, psychological research has demonstrated that names affect judgments and behavior. Our research investigates whether middle initials in names affect person perception.

#### **What do Middle Initials Represent?**

We are interested in how middle initials affect person perception. We argue that people's middle initials have a particular and powerful effect on how people are perceived by others. We are primarily interested in how middle initials affect the perception of people's intellectual performance, their intellectual capacity and correlates of these qualities. In order to understand this reasoning, it is essential to examine a correlate of inferred intellectual performance and capacity: perceived social status.

We propose that names, and in particular the display of middle initials, impacts on "the extent to which an individual or group is respected or admired by others" (Magee & Galinsky, 2008, p. 364), which in psychology is often referred to as perceived social status (see also Ridgeway & Walker, 1995). It seems common that people add symbolic

representations to their names that reflect a role in society, whether these representations reflect people's political standing (e.g., Princess, Lord, 'von') or their professional achievements (e.g., Dr., MSc, MISCP). Past research indicates that people infer the perceived social status of others partly on the basis of personal attributes (e.g., Keltner, Gruenfeld, & Anderson, 2003; Kemper, 1989; 1991; Goffman, 1951; Griskevicius, Tybur, & Van den Bergh, 2010; O'Cass & Frost, 2002; O'Cass & McEwen, 2006). These status inferences can subsequently benefit the perceived person, for example because those with high social status are treated favorably in negotiations (Ball & Eckel, 1998; De Kwaadsteniet & Van Dijk, 2010) and are seen as more prominent and prestigious (Goffman, 1951; Keltner et al., 2003, p. 266; see also Kemper, 1991).

We examine the effect that the display of middle initials (e.g., Jane *F. P. R.* Smith) may have on inferred status and domains of intellectual performance. Specifically, we argue that the display of middle initials *increases* the perceived social status of these people and positively biases inferences about their intellectual capacity and performance. Why would people make such inferences? In intellectual domains (e.g., academic publications, letters sent by lawyers or medical doctors) names are often presented in a formal way, including the person's middle initials. Intellectual performance seems thus associated with the occurrence of middle initials. In contrast, other types of performances (e.g., athletic achievement) are less likely to be associated with middle initials because in these domains they are unlikely to be mentioned. Given this relatedness of displaying middle initials and the intellectual domain, we argue that middle initials increase judgments of intellectual performance and perceived status.

It is important to conceptually distinguish perceived status from perceived intellectual performance. Perceived status reflects a general evaluation of respect and admiration by others (e.g., Magee & Galinsky, 2008; Ridgeway & Walker, 1995). Intellectual performance,

however, relates to more specific domains, such as writing ability or academic knowledge in particular. To illustrate these conceptual differences, someone who is considered to possess relatively high status (e.g., a bank CEO) may nonetheless be perceived as incompetent in specific circumstances (e.g., approving dangerous investments). It is likely, however, that there usually is a positive relationship between perceived status and perceived intellectual performance. In the context of middle initials, we pose that the middle initials effect on judgments of intellectual performance is *mediated* by general status inferences: First the presence of middle initials in names suggests to people that the target has a relatively high status in an intellectual domain, and from this they infer relatively high intellectual performances. In a series of seven studies, we tested the hypothesis that middle initials increase the perception of intellectual performance, and we tested whether this effect is mediated by status inferences. Table 1 provides a schematic overview of the seven studies.

The current study of a middle initials effect is first in its kind and offers contributions that extend to a much broader scope than middle initials alone. For example, we propose that middle initials positively affect intellectual performance perceptions and expectations, but do not enhance perceived performance and expectations in non-intellectual domains. This boundary condition may also be found in alternative status perception cues, such as luxury brands (Nelissen & Meijers, 2011). More generally, studying domain specificity of status-based inferences, as we propose above, deepens our understanding about the particular psychological processes underlying these inferences, and how they are affected by relevant context. Besides these advances, the existence of a middle initials effect holds implications for society, for example in contexts such as job applications, evaluations of performance, and the perceived legitimacy of impactful decisions such as within the legal system, politics, or business.

### Study 1: Writing Performance

As first test of the proposed middle initial effect, we examined the influence of middle initials on perceived intellectual performance. Specifically, we tested whether middle initials positively affect perceived intellectual performance in the form of evaluations of an author's writing skills. In addition, we examined whether perceived writing performance increases with the amount of middle initials in a name.

#### Method

After providing informed consent, eighty-five students from the University of Limerick (21 men, 64 women;  $M_{\text{age}} = 19.80$ ,  $SD = 5.72$ ) were randomly assigned to one of the four conditions of a between-subjects design. Participants were requested to read an extract written by the author 'David Clark' with zero, one ('F.'), two ('F. P.') or three ('F. P. R.') middle initials, varied between subjects. The author's name was subtly displayed above the text. The extract concerned a non-technical discussion on general relativity (e.g., "experiments and observations show that Einstein's description accounts for several effects that are unexplained by Newton's law, such as minute anomalies in the orbits of Mercury and other planets"). Next, participants indicated their agreement with the item "this extract is well written" on a scale from 1 (*not at all*) to 7 (*very much*). Afterwards, participants were thanked and debriefed.

#### Results and Discussion

A one-way ANOVA revealed significant differences between the middle initials conditions,  $F(3, 78) = 4.72$ ,  $p < .01$ ,  $\eta^2 = .15$ . To examine whether middle initials increased evaluations of writing performance, we compared the no middle initials condition against the combined three other conditions. Indeed, the middle initials conditions yielded more positive evaluations of writing performance ( $M = 5.62$ ,  $SD = 1.04$ ) compared to the no middle initials control ( $M = 4.92$ ,  $SD = 1.50$ ),  $t(78) = 2.50$ ,  $p = .02$ ,  $d = 0.57$ . Examination of the specific

means indicated significant differences between control and one middle initial ( $M = 5.80$ ,  $SD = 0.68$ ),  $t(78) = 2.33$ ,  $p = .02$ ,  $d = 0.53$ , no significant difference from two middle initials ( $M = 5.05$ ,  $SD = 1.23$ ),  $t(78) = 0.38$ ,  $p = .70$ ,  $d = 0.09$ , and a significant difference from three middle initials ( $M = 6.00$ ,  $SD = 0.85$ ),  $t(78) = 3.23$ ,  $p < .01$ ,  $d = 0.73$ . Inspection of trends indicated a significant linear trend,  $F(1, 78) = 6.59$ ,  $p = .01$ , and a cubic one,  $F(1, 78) = 7.40$ ,  $p < .01$ . This cubic trend represents an imperfection that can be specifically attributed to the condition with two middle initials, which did not differ significantly from the condition with no middle initials. Following this analysis, we conclude that the middle initials effect is overall reliable, but that its robustness needs to be investigated further. In addition, it appears that the middle initials effect does not simply increase in a linear fashion as a function of the amount of middle initials, and it seems that one middle initial is sufficient to produce the middle initials effect.

### **Study 2: When and Why Middle Initials are Displayed**

We argue that the previously observed middle initials effect stems from an association of middle initials with domains of intellectual performance. If this assumption is correct, then people should expect those involved in domains of intellectual performance to be more likely to use middle initials than others. This crucial assumption was tested in Study 2 by asking participants to indicate whether or not they expected a person to indicate middle initials in the context of a variety of organizations, half of which were associated with an intellectual domain of performance whereas the other half were not. It was predicted that participants would expect greater display of middle initials in relation to organizations that were associated with intellectual performance relative to the organizations that were not associated with intellectual performance. Further, we examined whether the display of middle initials would be interpreted by people as signaling high social status.

## Method

Forty-eight students from the University of Limerick (12 men, 36 women;  $M_{\text{age}} = 23.40$ ,  $SD = 7.95$ ) took part in a within-subjects study. After giving informed consent, participants read about four organizations that presumably were highly associated with intellectual performance (International Research Council, Writers Club, Wine Tasters Club, & European Art Association) and four that were less associated with intellectual performance (Rugby Fan Club, Neighborhood Barbeque Committee, Karaoke Club, & Local Pub Dart Team) and indicated whether they would or would not expect a person named “David F. P. R. Mitchell” to use his middle initials in eight organizations. The order of organizations and corresponding judgments was randomized. Participants indicated on an identical scale the extent to which the names “David Mitchell” and “David F. P. R. Mitchell” could be used to signal high status, in randomized order. Finally, they indicated on identical scales whether each of the organizations, in randomized order, would be seen as more or less intellectual (“Members of this organization are generally perceived to be intellectual”; 1 = *not at all*, 7 = *very much*). Afterwards, participants were thanked and debriefed.

## Results and Discussion

In order to test whether displaying middle initials was more frequently expected in relation to organizations associated with intellectual domains of performance, we examined how often middle initials were expected for the four organizations highly associated with intellectual performance compared to the four that were less associated with intellectual performance. Specifically, participants indicated whether they expected middle initials for each of four organizations associated with high intellectual performance and four associated with low intellectual performance. Thus, the theoretical range of these indices is from zero to four. A paired-sample t-test indicated that middle initials were more frequently expected to be displayed in the context of organizations associated with intellectual performance ( $M = 2.58$ ,

$SD = 1.22$ ) compared to those less associated with intellectual performance ( $M = 0.08$ ,  $SD = 0.28$ ),  $t(47) = 13.45$ ,  $p < .001$ ,  $d = 3.92$ . Note that the amount for the non-intellectual organizations was impressively close to the lower boundary of the range (0 to 4).

After establishing that participants expected more middle initials for intellectual organizations compared to non-intellectual organizations, we next tested whether higher status was signaled by the name with middle initials compared to the name without middle initials. A paired sample t-test confirmed that “David F. P. R. Mitchell” signaled higher perceived status ( $M = 5.71$ ,  $SD = 1.74$ ) than “David Mitchell” ( $M = 3.12$ ,  $SD = 1.92$ ),  $t(47) = 7.67$ ,  $p < .001$ ,  $d = 2.24$ .

Were the intellectual organizations indeed perceived as more intellectual as the non-intellectual organizations? A paired-sample t-test confirmed that the aggregated intellectualism ratings ( $\alpha = .86$ ) of the four highly intellectual organizations were significantly higher ( $M = 5.41$ ,  $SD = 1.24$ ) compared to aggregated ratings ( $\alpha = .86$ ) of the less intellectual organizations ( $M = 2.49$ ,  $SD = 1.36$ ),  $t(47) = 12.22$ ,  $p < .001$ ,  $d = 3.56$ .

So far, the results indicate that: (1) middle initials are more expected to be used in the context of intellectual organizations compared to non-intellectual organizations, (2) names with middle initials signal higher status compared to names without middle initials, and (3) the organizations that we grouped as intellectual were indeed perceived to be more intellectual compared to those that we grouped as non-intellectual. Do people expect the names with middle initials to be used in intellectual organizations because these names signal social status? Inspection of the zero-order correlations revealed that the more status participants assigned to the name with middle initials, the more they expected it to be used in the context of the intellectual organizations ( $r = .57$ ,  $p < .001$ ). No significant correlation was found between the status signaled by the name without middle initials and the expected use of the middle initial name in the context of intellectual organizations ( $r = -.24$ ,  $p = .10$ ), a

correlation that was significantly different from the previous, Williams'  $t(45) = 5.70, p < .001$  (Hittner & May, 1998). The frequency of middle initials expected in non-intellectual organizations did not significantly correlate with the status associated with the name when it had ( $r = -.04, p = .81$ ) or had no ( $r = -.06, p = .69$ ) middle initials, two correlations that did not significantly differ, Williams'  $t(45) = 0.12, p = .90$ .

Moreover, participants' perceived intellectuality ratings of the intellectual organizations correlated positively with the frequency of expected middle initials used in these intellectual organizations ( $r = .54, p < .001$ ), whereas no significant correlation emerged between perceived intellectualism of the non-intellectual organizations and the expected use of middle initials in these non-intellectual organizations ( $r = 0.17, p = .25$ ), two correlations that significantly differed, *modified Pearson-Filon statistic* = 2.025,  $p = .04$  (Raghunathan, Rosenthal, & Rubin, 1996). Possibly, the absence of a significant correlation between the perceived intellectualism of the non-intellectual organizations and the expected use of names with middle initial in these organizations stems from the almost invariant absence of expected middle initials in these organizations (only 44 of 48 participants did not expect *any* names with middle initials in the context of these organizations).

Overall, these results confirm our hypothesis that people consider middle initials to be strongly associated with contexts in which intellectual performance matters and that displaying middle initials would be interpreted as indicator of high social status.

### **Study 3: A Boundary Condition of Middle Initials Effect on Performance Expectations**

After establishing that middle initials are indeed closely related to intellectual domains of performance in Study 2, we sought to test whether the middle initial effect on performance evaluations was limited to this domain. We argue that middle initials positively contribute to domains of *intellectual* performance in particular because for this domain the display of middle initials is commonly expected (Study 2). In contrast, however, middle

initials are not expected for non-intellectual domains (e.g., athletic performance) because there the display of middle initials is presumably more unusual. We therefore examined whether domains *not* related to intellectual performance posed a boundary condition for the middle initials effect. Specifically, we examined whether people would prefer to join a competition team that was comprised of members with many versus few middle initials in their names, but only if this competition involved an expected *intellectual* performance rather than *athletic* performance. Such preferences, we assumed, would reflect underlying expectations about the team members' performance.

### Method

Eighty-nine students from the University of Limerick ( $M_{\text{age}} = 21.27$ ,  $SD = 3.08$ ; 29 men, 57 women, 3 undeclared) participated in a between subjects study and were randomly assigned to one of the conditions of a 2 (Domain of Performance: Intellectual vs. Athletic) x 2 (Most Middle Initials: Team A vs. Team B) x 2 (Evaluated Team: Team A vs. Team B) mixed design, with Performance Domain and the team with Most Middle Initials as between subjects factor, and the Evaluated Team as within subjects factor. Participants imagined that they took part in a competition between two teams with a € 500.- prize. Depending on the assigned condition, this competition related to intellectual performance (a quiz about literature, science, art, and history) or athletic performance (a sports event involving rugby, long jump, and mountain biking). Participants were presented with the names of each teams' three members (e.g., David Mitchell); the team to which the names belonged was randomly determined. The members of one team always had more middle initials compared to the members of other team (1, 3, and 2 vs. 0, 1, and 0 middle initials), hence, either Team A had most middle initials or Team B had most middle initials. Next, participants indicated the extent to which they would be likely to join each team of the teams in order to win the competition, both on seven-point scales from 1 (*not at all*) to 7 (*very much*). We assumed that

this preference reflected participants' expected higher performance of these teams.

Afterwards, participants were thanked and debriefed.

### Results and Discussion

Participants' preferences for teams were compared using a mixed-model ANOVA with the Domain of Performance (Intellectual vs. Athletic) and the Most Middle Initials manipulation (Team A vs. Team B) as between-participants variables and with the evaluations of the teams as within-participants variable. As reflected in Figure 1, this analysis first of all revealed generally higher preferences for Team A relative to Team B,  $F(1, 85) = 11.64, p < .001, \eta^2 = .12$ , and also a marginally higher ratings when the teams' members had most versus least middle initials,  $F(1, 85) = 3.14, p = .08, \eta^2 = .04$ . No main effect of the performance domain was observed ( $F < 1$ ). No reliable two-way interaction effects were observed for the rated team and the Most Middle Initials manipulation,  $F(1, 85) = 1.38, p = .24, \eta^2 = .02$ , for the rated team and the Domain of Performance,  $F(1, 85) = 2.80, p = .10, \eta^2 = .07$ , and also not for the Most Middle Initials manipulation and the Domain of Performance ( $F < 1$ ). Importantly, however, the expected three-way interaction was significant,  $F(1, 85) = 6.73, p = .01, \eta^2 = .07$ , indicating that people's preferences to join either one of the teams critically depended on how many middle initials the teams' members had and what the domain of performance was.

In order to examine the above three-way in more detail, we examined the two-way interactions for the intellectual and athletic domains. The presence of middle initials did not have a significant effect on differences in joining preferences in the athletic performance domain,  $t(85) = .98, p = .31, d = .21$ . For the intellectual performance domain, however, joining preferences for Team A versus Team B were moderated by the amount of middle initials of the members in the teams,  $t(85) = 2.74, p < .01, d = .59$ . Analysis of the simple effects confirmed that participants were more eager to join Team A in the intellectual

competition when this team's members had the most middle initials ( $M = 5.43$ ,  $SD = 1.56$ ) compared to when the other team's members had most middle initials ( $M = 4.54$ ,  $SD = 1.35$ ),  $t(85) = 2.05$ ,  $p = .04$ ,  $d = .44$ ; participants were also more eager to join Team B in the intellectual competition when this team's members had the most middle initials ( $M = 4.17$ ,  $SD = 1.44$ ) compared to when the other team's members had most middle initials ( $M = 2.91$ ,  $SD = 1.31$ ),  $t(85) = 2.80$ ,  $p < .01$ ,  $d = .61$ . Similar analyses indicated no significant differences in preferences for joining the teams in the athletic performance domain (all  $ps > .11$ ). These results confirm our prediction that in an intellectual domain people prefer to be in teams with members who have middle initials. Assuming that joining preferences reflect expectations about performance, these results are consistent with our general argument that middle initials shape expectations of high intellectual capacity.

#### **Study 4: Perceived Status**

The results of Study 1 demonstrated the existence of a middle initials effect on perceived performance. Study 2 further confirmed that middle initials are more commonly expected in intellectual domains and that their display would enhance perceptions of social status, and Study 3 indicated that expected performance indeed increases as a result of middle initials when the domain of performance is intellectual in particular. The following studies were designed to further understand the role of inferences about the perceived social status related to the display of middle initials for the emergence of the middle initials effect.

Given that the use of middle initials occurs often in intellectual domains, they may well be associated with perceived status, which reflects a sense of admiration and respect for the person in question (Magee & Galinsky, 2008). We thus suggest that middle initials increase expected intellectual performance due to the higher perceived status that is attributed to people who have many middle initials in their names. In Study 4, we tested the relation between middle initials and perceived status directly.

Specifically, we compared status evaluations of names with middle initials to names without middle initials, names with lengthy surnames, and names with an ‘infix’ (a short word between the first and last name). In the previous study, we compared many against fewer middle initials. However, this comparison leaves the possibility that name length or perhaps perceived exceptionality of the name drive the effect we attribute to the presence of middle initials. We hence included a ‘long surname’ and ‘infix’ condition to rule out these alternative interpretations. It was predicted that people carrying a name with middle initials would be perceived as higher in status compared to people with a name that did not have middle initials, compared to people with a long surname, and compared to people with an ‘infix’ between their first and last name.

### **Method**

Thirty-six students from the University of Limerick (15 men, 21 women;  $M_{\text{age}} = 20.82$ ,  $SD = 4.00$ ) participated in study with a within-participants design. After giving informed consent, participants indicated whether names signaled status on seven-point scales from 1 (*not at all*) to 7 (*very much*). First they evaluated a standard name (David Mitchell), then one with an infix (David van Mitchell), one with initials (David F. P. R. Mitchell), and one with an addition of “son” at the end (David Mitchellson). The same was repeated for two other groups of names (with James Teesdale and Steve Sandford as standard names). Participants were thanked and debriefed upon completion of the study.

### **Results and Discussion**

An ANOVA for repeated measures with the name (control vs. middle initials vs. infix vs. long surname) as independent variable and the averaged perceived status ratings (all  $\alpha > .74$ ) as dependent variable indicated significant differences across the names,  $F(3, 105) = 23.32$ ,  $p < .001$ ,  $\eta^2 = .40$ . Names with the infix signaled higher perceived status compared to standard names,  $t(35) = 5.06$ ,  $p < .001$ ,  $d = 1.71$ , and compared to names with the long

surname condition,  $t(35) = 2.86, p < .01, d = 0.97$ . Furthermore, the perceived status for the long surname condition differed from control,  $t(35) = 2.30, p = .03, d = 0.78$ . Most importantly, however, the names with middle initials indicated higher perceived status ( $M = 5.14, SD = 1.43$ ) compared to control ( $M = 2.99, SD = 1.40$ ),  $t(35) = 6.58, p < .001, d = 2.22$ , compared to names with an infix ( $M = 4.30, SD = 1.36$ ),  $t(35) = 3.89, p < .001, d = 1.32$ , and compared to the long surnames condition ( $M = 3.50, SD = 1.45$ ),  $t(35) = 4.98, p < .001, d = 1.68$ . These results thus indicate that middle initials increase perceived status more than any of the other name features.

### **Study 5: Inferred Intellectual Performance and Perceived Status**

We argue that middle initials increase perceived status and subsequently elevate perceived intellectual performance, similar to the prominence and prestige that is attributed to people who are perceived as high in perceived status (Goffman, 1951; Keltner et al., 2003, p. 266; see also Kemper, 1991). In Study 5, we tested this mediating role of perceived status experimentally (Spencer, Zanna, & Fong, 2005). Specifically, we manipulated both the presence of middle initials and the perceived status in an academic context. As before, we predicted that middle initials would increase perceived intellectual performance of an author when no explicit status perception cue was presented. In addition, we expected that the perceived status cue would override the effects of the middle initials, with lower evaluations when the author was said to be a first year student (low perceived status) compared to when the author was said to be a professor (high perceived status).

#### **Method**

One-hundred students from the University of Limerick ( $M_{\text{age}} = 21.29, SD = 3.21$ ; 53 men, 47 women) were randomly assigned to the six conditions of a 2 (Middle Initials: No vs. Yes) x 3 (Status Cue: Student vs. No Cue vs. Professor) between-factorial design. After giving informed consent, participants reported demographic information and read the extract

used in Study 1. Depending on the Middle Initials condition, the extract's author was either "David Mitchell" or "David F. P. R. Mitchell." In addition, the author's name in the Student condition was followed by the label "a first year physics student" whereas the label read "a professor in physics" in the Professor condition; no label was provided in the No Cue condition. A within subjects pilot study ( $N = 20$ ) confirmed that the student label was associated with significant less perceived status ( $M = 3.20$ ,  $SD = 1.40$ ) compared to the professor label ( $M = 5.50$ ,  $SD = 1.28$ ),  $t(19) = 6.34$ ,  $p < .001$ ,  $d = 2.91$ .

After reading the article extract, participants evaluated the author's writing skills on six items (e.g., "To what extent do you find this extract to be clearly written?") using seven-point interval scales from 1 (*not at all*) to 7 (*very much*). Afterwards, participants were debriefed, thanked, and rewarded.

## Results and Discussion

As reflected in Figure 2, a two-way ANOVA on the aggregated and recoded evaluation items ( $\alpha = .82$ ) with the Status Cue and Middle Initials manipulations as independent variables revealed a non-significant main effect of the Middle Initials manipulation ( $F < 1$ ).

In addition, we found a significant main effect of the Status Cue manipulation,  $F(2, 94) = 4.26$ ,  $p = .02$ ,  $\eta^2 = .08$ . Specifically, the evaluations were significantly higher when the professor cue was presented ( $M = 5.03$ ,  $SD = 0.89$ ) compared to when the student cue was presented ( $M = 4.41$ ,  $SD = 0.90$ ),  $t(94) = 2.87$ ,  $p < .01$ ,  $d = .59$ , indicating that the professor label elicited more favorable perceptions of the written piece compared to the student label. Importantly, the predicted qualifying interaction was present,  $F(2, 94) = 4.05$ ,  $p = .02$ ,  $\eta^2 = .08$ , and we examined three two-way interactions embedded within the three-way interaction next: As predicted, we observed an interaction of Initials (Yes vs. No) and the Cue (Professor vs. No Cue),  $t(94) = 2.07$ ,  $p = .04$ ,  $d = .43$ , a significant Initials (Yes vs. No) x Cue (Student

vs. No Cue) interaction  $t(94) = 2.73, p < .01, d = .56$ , but no Initials (Yes vs. No) x Cue (Student vs. Professor) interaction ( $t < 1$ ). The interaction between the Status Cue and Middle Initials manipulations suggests that when no status cue is given the effects of the middle initials are caused by inferences regarding the status of the author.

Analysis of simple effects confirmed that when no status cue was present, evaluations were significantly more positive when the author had three middle initials ( $M = 4.49, SD = 0.91$ ) compared to when the author had no middle initials ( $M = 5.15, SD = 0.88$ ),  $t(94) = 2.12, p = .04, d = 0.44$ ; and the differences between the two initial conditions was not reliable when the when the ‘professor’ status cue was present ( $t < 1$ ). An unexpected marginal difference was observed between the initial conditions for the ‘first year student’ authors,  $t(94) = 1.73, p = .09, d = 0.36$ , suggestion that the extract might have been less positively evaluated when the first year student had three versus no middle initials ( $M = 4.16, SD = 0.73$ , vs.  $M = 4.68, SD = 1.00$ ). This unexpected difference may reflect a tendency for participants to disapprove from a low perceived status target who presents many middle initials.

In sum, middle initials led to positive evaluations of authors’ intellectual performance, but the initials effect disappeared when the proposed mediating process—perceived status—was directly manipulated. In other words, the explicit presence of status perception cues overruled the initials effect on intellectual performance, suggesting that perceived status is the mediating variable (Spencer et al., 2005).

### **Study 6: Integrating Methods and Findings Using a Different Sample**

Thus far, we observed that middle initials impact on indicators of expected or attributed intellectual performance and this effect seems to be mediated by perceived status. Study 6 was designed to extend and integrate several of the previous findings. First of all, whereas we relied on a predominantly Western European sample in the other studies, participants in the current study were sourced using a public psychology research website that

was mostly visited by people from the USA. We tested the association between the amount of middle initials in names with both levels of expected intellectual and athletic *performance* and expected levels of intellectual and athletic *capacity* (e.g., level of education and knowledge). Whereas capacity reflects the athletically or intellectually potential of a person (e.g., having been trained in using the scientific method), actual performance refer to the materialization of this potential. Importantly, perceived status cannot directly “explain” intellectual performance: When middle initials are used as a cue to infer perceived status, then people assume that others have a relatively high intellectual capacity. We therefore expected that perceived status mediated the effect of middle initials on intellectual capacity in particular. In addition, the names in this study referred to women rather than men because most of our other studies referred to male names. That is, replicating the middle initials effect would indicate that it is independent of gendered names. Finally, we again included a variation of the domain of performance as a boundary condition for the initials effect (see Study 3).

### **Method**

Ninety-two visitors of the research website named ‘Psychological Research on the Net’ participated in a study with a within-participants design (21 men, 71 women;  $M_{\text{age}} = 25.27$ ,  $SD = 10.65$ ). After giving their informed consent, participants were asked to imagine that they took part in a competitive quiz about literature, science, art, and history, with a €500.- prize for the best team. Participants subsequently were to select two members for their teams from a sample of four named candidates (e.g., Ann Graham). Importantly, one of these candidates had no middle initials, one had a single middle initial, one had two middle initials, and one had three middle initials. The order in which the names were displayed was varied randomly. After selecting the two preferred team members, participants were asked to imagine that they also took part in a sports competition involving rugby, long jump, and

mountain biking, involving a prize of 500 Euro. Again, participants selected two members from a (different) sample of four named candidates (e.g., ‘Elaine Sandford’); one of these candidates had no middle initials, one had a single middle initial, one had two middle initials, and one had three middle initials, and the order of names was varied randomly. Next, participants indicated the extent to which they expected each of the eight women to have high perceived status, great intellectual capacity, and great athletic capacity on scales from 1 (*not at all*) to 7 (*very much*). Afterwards, participants were thanked and debriefed.

### **Results and Discussion**

**Expected performance.** We first computed the summed amount of initials of the selected members for both the intellectual quiz and sports competition teams. These sum scores were then compared using a paired-sample t-test. As predicted, participants chose members with more initials to perform in their intellectual quiz team ( $M = 3.04$ ,  $SD = 1.32$ ) compared to their sports competition team ( $M = 2.64$ ,  $SD = 1.40$ ),  $t(90) = 2.08$ ,  $p = .04$ . Hence, names with more middle initials were preferred when the competition involved an intellectual competition relative to a non-intellectual competition, indicating that participants indeed expected greater intellectual performance relative to athletic performance of those with many versus few middle initials.

#### **Perceived status, expected intellectual capacity, and expected athletic capacity.**

We sought to associate the amount of middle initials across the eight names with the perceived status, expected intellectual capacity, and expected athletic capacity. In order to do, we first computed participants’ average ratings on these variables across the pairs of names that had the same amount of middle initials. Thus, for every participant we ended up with four averaged perceived status, intellectual capacity, and athletic capacity score. As a next step, a “disaggregated data file” was created in which the name evaluations for the four middle initial amounts (0, 1, 2, or 3) were nested within each participant. Specifically, this

data file contained four rows with data per participant, with the four rows reflecting 0, 1, 2, and 3 initials, and a participant identification number identified which rows belonged to each participant. Disaggregating data in such a manner is required for multilevel analyses (Snijders & Bosker, 2004, pp. 15-16), which were conducted subsequently.

A multilevel analysis was conducted in which the participants represented the higher level, in which the amount of middle initials was included as continuous lower level predictor, and in which perceived status was included as dependent variable. Given that evaluations were expected to vary across participants, we included a random effect of the participant variable. Two similar multilevel analyses were conducted with intellectual and athletic capacity as dependent variables, respectively.

As reflected in Figure 3, the multilevel analyses indicated that the amount of middle initials in the names significantly predicted perceived status,  $\tau = 0.28$ ,  $S_e = 0.05$ ,  $t(268.90) = 5.10$ ,  $p < .001$ , and their expected intellectual capacity,  $\tau = 0.22$ ,  $S_e = 0.05$ ,  $t(262.16) = 4.94$ ,  $p < .001$ . Moreover, a marginal negative association between the amount of middle initials and expected athletic capacity was observed,  $\tau = -0.10$ ,  $S_e = 0.05$ ,  $t(262.43) = 1.78$ ,  $p = .08$ . As predicted, the presence of middle initials thus increased perceived status and expected intellectual capacity whereas it did not increase (or possibly even decreased) expected athletic ability. These results confirm that middle initials indeed positively contribute to perceived status and expectations of high *intellectual* capacity in particular.

An additional multilevel model with both the amount of middle initials and perceived status as continuous lower level predictors of expected intellectual capacity revealed that the effect of the amount of middle initials on perceived intellectual capacity was descriptively smaller,  $\tau = 0.10$ ,  $S_e = 0.04$ ,  $t(266.35) = 2.37$ ,  $p = .02$ , relative to when perceived status was not included,  $\tau = 0.22$ ,  $S_e = 0.05$ ,  $t(262.16) = 4.94$ ,  $p < .001$ , as reported above). Moreover,

perceived status significantly predicted subsequent intellectual capacity ratings,  $\tau = 0.41$ ,  $S_e = 0.04$ ,  $t(330.87) = 9.48$ ,  $p < .001$ .

To examine the proposed mediation by perceived status, we subjected these findings to the online mediation tool developed by Selig and Preacher (2008). A Monte Carlo method employing 20,000 repetitions indicated that the mediated effect was significantly positive,  $0.05 < B_{95} < 0.20$ , confirming that the effect of middle initials on expected intellectual capacity was indeed mediated by perceived status.

### **Study 7: Full Mediation Model**

Our studies reveal the existence of middle initials effects on expected and inferred intellectual performance and capacity, and they suggests that perceived status is a possible mediating variable. We proceeded in Study 7 with testing the full meditation process in which many versus few middle initials would lead to greater perceived status, perceived status would in turn increase the expected intellectual capacity, and the expected intellectual capacity would subsequently predict expectations of intellectual performance. Specifically, we examined the middle initial effect using a hypothetical competition where preferences to join the competition team was indicative of their expected performance.

### **Method**

Seventy-six students from a Western European university (36 men, 40 women;  $M_{\text{age}} = 22.00$ ,  $SD = 7.48$ ) were asked to imagine that they took part in a competitive intellectual quiz with two teams, similar to the procedure involving the intellectual competition scenario in Study 3. The members of one team always had more middle initials compared to the members of other team (1, 3, and 2 vs. 0, 1, and 0 middle initials). Next, participants indicated the extent to which they would be likely *to join* each of the two teams in order to win the intellectual quiz, both on seven-point scales from 1 (*not at all*) to 7 (*very much*). This preference thus reflected participants' expected higher *intellectual performance* of these

teams. Participants then indicated on two similar scales whether they thought that the members of each team had high perceived *status*. Expected *intellectual capacity* was measured by asking participants on similar scales as above whether the members of the teams were highly *educated* and had much *knowledge* about the quiz' topics. Afterwards, participants were thanked and debriefed.

### Results and Discussion

First, participants' joining preferences were entered as dependent variables into an ANOVA for repeated measures with the rated team as within subject factor and the Most Middle Initials manipulation as between-participants factor. This analysis revealed neither a significant difference across the two evaluated teams ( $F < 1$ ), nor a significant main effect of the Most Middle Initials manipulation ( $F < 1$ ), but did reveal the predicted interaction effect,  $F(1, 72) = 8.24, p < .01, \eta^2 = .10$ , indicating that the team in which members had the most middle initials was considered most preferable to join (Figure 4a). Hence, the middle initials effect was also reflected in preferences for joining either one of the teams.

A similar analysis on perceived status revealed neither a significant difference across the evaluated teams ( $F < 1$ ), nor a significant main effect of the Most Middle Initials manipulation ( $F < 1$ ), but did reveal the crucial interaction effect,  $F(1, 74) = 9.07, p < .01, \eta^2 = .11$ , indicating that the members of the team in which members had the most middle initials were considered to hold the highest perceived status (Figure 4b). This result replicates the earlier finding that middle initials increase perceived status.

Next, we averaged the members' perceived knowledge and level of education for each team ( $r_A = .61, p < .001, r_B = .57, p < .001$ ) and then entered these scores as dependent variables into a repeated ANOVA with the rated team as within subject factor and the Most Middle Initials manipulation as between subjects factor. The analysis yielded no significant differences across the two evaluated teams ( $F < 1$ ), a marginally significant main effect of the

Most Middle Initials manipulation was found,  $F(1, 74) = 2.80, p = .10, \eta^2 = .04$ , and the analysis revealed the critical interaction between the Most Middle Initials and the team that was evaluated,  $F(1, 74) = 7.95, p < .01, \eta^2 = .10$ , indicating that the team in which members had the most middle initials was expected to have the highest intellectual capacity (Figure 4c).

We next evaluated the structural equation model depicted in Figure 5, in which we tested (1) whether having most middle initials in a team increases the inferred *status*, which (2) increases expected *intellectual capacity* in that team, and hence (3) makes people *prefer to join the team* that they expect to perform better. For this purpose we calculated difference scores and entered these in a model in which intellectual capacity was represented as a latent factor. The model provided an excellent fit,  $\chi^2(5) = 4.55, p = .74, RMSEA = 0.00, TLI = 1.00, CFI = 1.00$ .

Estimates of direct and indirect effects were obtained using a bias-corrected bootstrap method (Efron, 1987; 5,000 bootstraps; see also Hayes, 2009). A significant association was observed between the Most Middle Initials manipulation and perceived status,  $B = -1.45, p < .01$ , indicating that Team A was regarded to have higher perceived status when the members of Team A compared to Team B had the most middle initials. In addition, the perceived status of Team A over Team B significantly predicted expected intellectual capacity in Team A over Team B,  $B = 0.67, p < .01$ , with both knowledge and education difference scores loading on intellectual capacity,  $B = 0.98, p < .001, B = 0.86, p < .001$ , respectively. Furthermore, the expected intellectual capacity of Team A over Team B significantly predicted participants' preferences for Team A compared to Team B,  $B = 1.29, p < .001$ . Finally, all seven indirect effects were significant (all  $ps < .01$ ). Taken together, the statistical model is thus highly consistent with our theoretical model.

In sum, preferences between groups in order to win an intellectual quiz were affected by the amount of middle name initials of the group members. More specifically, we found that increasing initials elevated the perceived status and expected intellectual capacities of the group members, and these subsequently affected social intentions. Although some caution is warranted given the relatively small sample size for the structural equation model, these results are consistent with the previous studies and our predictions.

### **General Discussion**

Of whom do people expect a higher intellectual capacity and performance: Jane Smith or Jane F. P. R. Smith? Who would be more admired and respected? Who would earn more? Eight studies indicate that—from the perspective of other people’s inferences—the answer is consistently ‘Jane F. P. R. Smith.’ Authors with middle initials compared to authors with no (or less) middle initials were perceived to be better writers (Studies 1 & 5). In addition, people with names that included middle initials were expected to perform better in an intellectual—but not athletic—competition (Studies 3 & 6), were anticipated to be more knowledgeable, and to have a higher level of education (Study 7). In addition, a similar pattern of results was obtained on perceived status (Studies 2 & 4), which was identified to mediate the middle initials effects (Studies 5, 6, & 7; Table 1).

### **Robustness of the Middle Initials Effect**

A first goal of the current investigation was to demonstrate the existence and the robustness of the middle initials effect. Indeed, a middle initials effect was identified on various indicators of perceived and expected intellectual performance by the first studies, including the quality of an author’s writing and people’s anticipated income. We additionally examined in detail the effect’s boundary conditions and mediational processes while also demonstrating the effect for people’s preferences in the context of intellectual competitions. Additional support for the robustness of the middle initials effect is evident from the use of

both male and female name variations and by observing the phenomenon across samples of Western Europeans as well as North Americans. Overall, these results thus point to the generality and the robustness of a middle initials effect on perceived and expected intellectual capacity and performance.

### **Boundary Conditions**

An essential feature of explaining psychological phenomena is to examine and identify their boundary conditions. Hence, identifying the specific circumstances need to be present for the occurrence of the effect. As a first step, we varied the context of expected performance by contrasting an intellectual to an athletic domain in Studies 3 and 6. The results confirm our predictions that the middle initials effect is associated with intellectual domains of performance. This is also consistent with the observation of Study 2 that in particular within the intellectual domain people expect others to display their middle initials and that middle initial are associated with social status. In sum, these findings imply that the potential positive bias due to the display of middle initials on person perception are at least limited to the intellectual domain. Alternative domains of performance may not, or may even be negatively affected.

### **Underlying Process**

In addition to examining the existence and boundaries of the middle initials effect, we sought to unravel the processes that underlie this use of name features to infer intellectual performance. We argued that people infer a higher perceived status for people with middle initials, and from that they infer higher expected intellectual performance. Studies 4 through 7 demonstrate that perceived status is positively implicated by the use of middle initials and that it underlies the observed effects on intellectual performance inferences. Indeed, in Studies 6 and 7 tests of perceived status as statistical mediator of the middle initials effect

supported this claim, and the mediating role of perceived status was experimentally validated in Study 5.

In sum, the studies demonstrate the existence of the proposed middle initials effect. We found that higher perceived status, expected and perceived intellectual capacity and performance was attributed to people with middle initials compared to people without middle initials. In addition, we found that ‘more middle initials are better than few’, that is, the attributions of status and intellect increased with the amount of middle initials in names. Note, we used different procedures in examining the middle initial effect, and most importantly, the effect seems powerful, as it can be detected for complex real life decisions such as those about the author list of academic journal publications.

### **Implication, Limitations, and Future Directions**

Although research exists regarding the implications of specific letters in one’s name—for example in relation to self-esteem and ageing prospects (Christenfeld et al., 1999; Nuttin, 1985; 1987)—our focus of the mere *presence* of middle name initials is unique. Our research shows how a relatively small name attribute can nonetheless have an influence on how we perceive and evaluate others. Even though the selection of our names is typically beyond our personal control, the decision of parents of whether or not to include middle names may have consequences for the individual.

In many of our studies, we examined the influence of middle initials on expected intellectual and athletic performance without randomly varying the names that we used. As a result, caution is warranted when generalizing the results to other names than those used in our studies (Judd, Westfall, & Kenny, 2012; Wells & Windschitl, 1999).

Future research may further examine additional boundary conditions of the middle initials effect and other psychological factors that may moderate the use of middle initials as a basis for perceived status and intellectual performance inferences, such as the need for

cognition or cognitive load. Moreover, the current research was conducted mainly among people from Western Europe and the USA. The use of middle initials in the context of intellectual performance is likely to differ cross-culturally, and the middle initials effect is thus likely to vary in strength across cultures. To be clear, in cultures where middle initials are uncommon, the effect should not emerge. Further, in cultures in which middle initials are displayed to identify family traditions or the like rather than displaying them in formal, intellectual contexts, the middle initial effects that we report should at least be reduced.

Can the middle initial effect be explained with real world differences? Possibly, social groups with habits of giving their children more middle names have overall more resources available for education than other social groups, this way affecting the relationship between perceived status and intellectual performance with middle initials. To examine this possible sociological relationship in more detail, future research should use large scale studies comparing names and perceived status of different social groups within and between societies. Note, however, that this potentially ‘objective’ root of the middle initials effect does not deny an important implication of our experimental studies: that attributions of status, intellectual capacity and performance based on middle initials are, at least in many cases, erroneous inferences. People’s reliance on middle initials as indicators of intellectual qualities seems to be far greater than any ‘true’ relationship between the two.

## **Conclusion**

Research has examined whether people like their own initials (e.g., Nuttin, 1985; 1987), and how initials affect our successes in life (Efthyvoulou, 2008; Einav & Yariv, 2006) as well as the proximity of death (Christenfeld et al., 1999). We add that the evaluation and expectations of people’s intellectual performance, intellectual capacity, and their perceived status increases with their middle initials; a finding that reflects the risk of erroneous inferences. Further, the middle initials effect is likely to be somewhat irritating to some of us:

People who do not have one or more middle initials in their name have a disadvantage compared to those with middle initials to be seen as intellectually capable and high performing.

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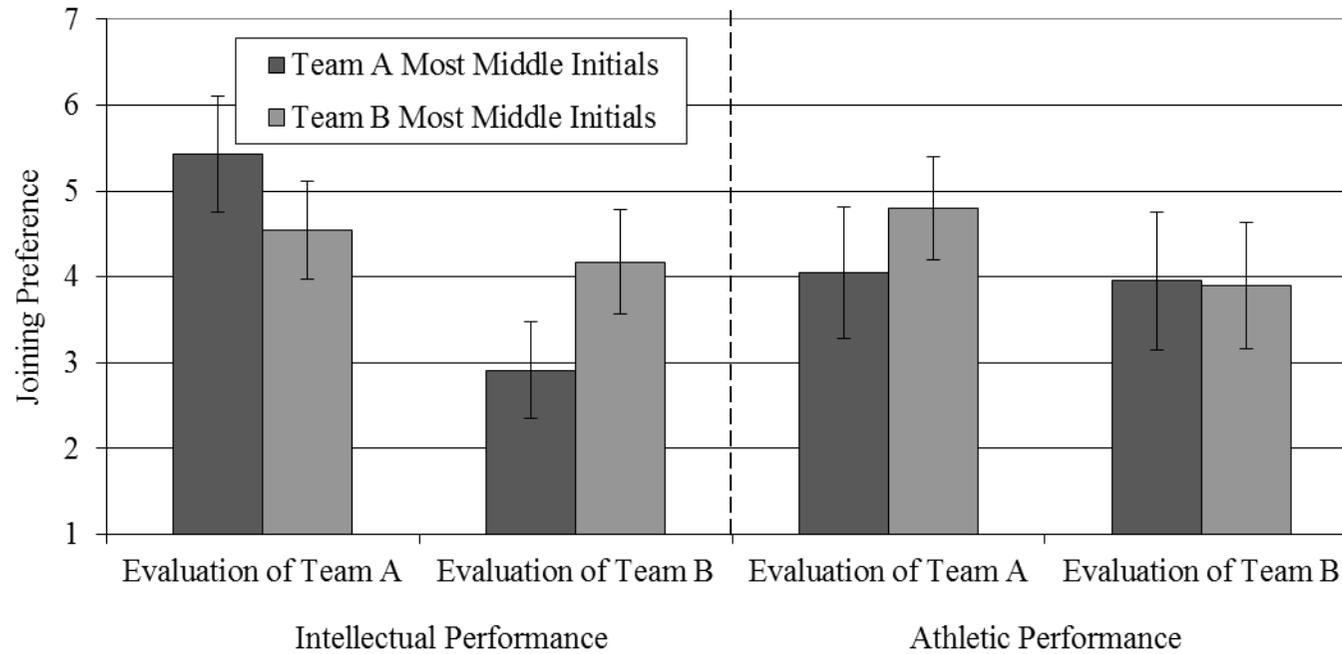
Table 1

*Overview of Study Designs and Findings*

Study	Design	Independent Variable	Mediator	Moderator	Independent Variable	Result
1	Between	MI amount	-	-	PIP	MI effect on PIP
2	Within	Intellectualism associated with organizations	-	-	Expected use of MI	Intellectual organizations foster expected use of MI
3	Mixed	MI amount Target team	-	Performance domain	EIP/EAP	MI effect on EIP but not EAP.
4	Within	MI amount	-	-	Perceived status	MI effect on perceived status
5	Between	MI amount	-	Explicit status	PIP	Explicit status cues override MI effect on PIP
6	Within	MI amount	Perceived status	Performance domain	EIP/EAP	MI effect on EIP but not EAP, mediated by perceived status
7	Within	MI amount Target team	Perceived status. Expected intellectual capacity	-	Joining preferences EAP	MI effect on EIP, mediated by perceived status and expected intellectual capacity

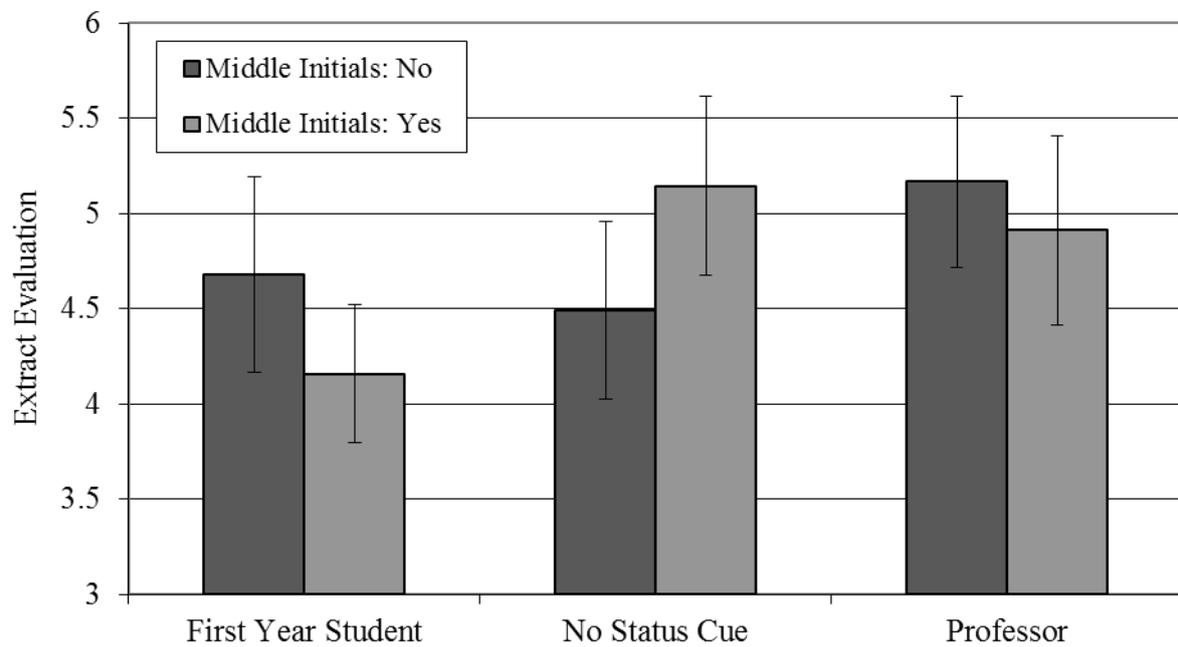
*Note:* MI = Middle initials, PIP = Perceived intellectual performance, EIP = Expected intellectual performance, EAP = Expected athletic performance.

Figure 1. Joining Preferences as a Function of Middle Initials and Domain of Performance (Study 3).



Note: Higher scores indicate greater joining preferences. Error ranges indicate the 95% confidence intervals.

Figure 2. Extract Evaluations as a Function of Initials and Status Cues (Study 5).



*Note:* Higher scores indicate more positive evaluations of the extract. Error ranges indicate the 95% confidence intervals.

Figure 3. Perceived Status, Expected Intellectual Capacity, and Expected Athletic Capacity as a Function of Middle Initials (Study 6).

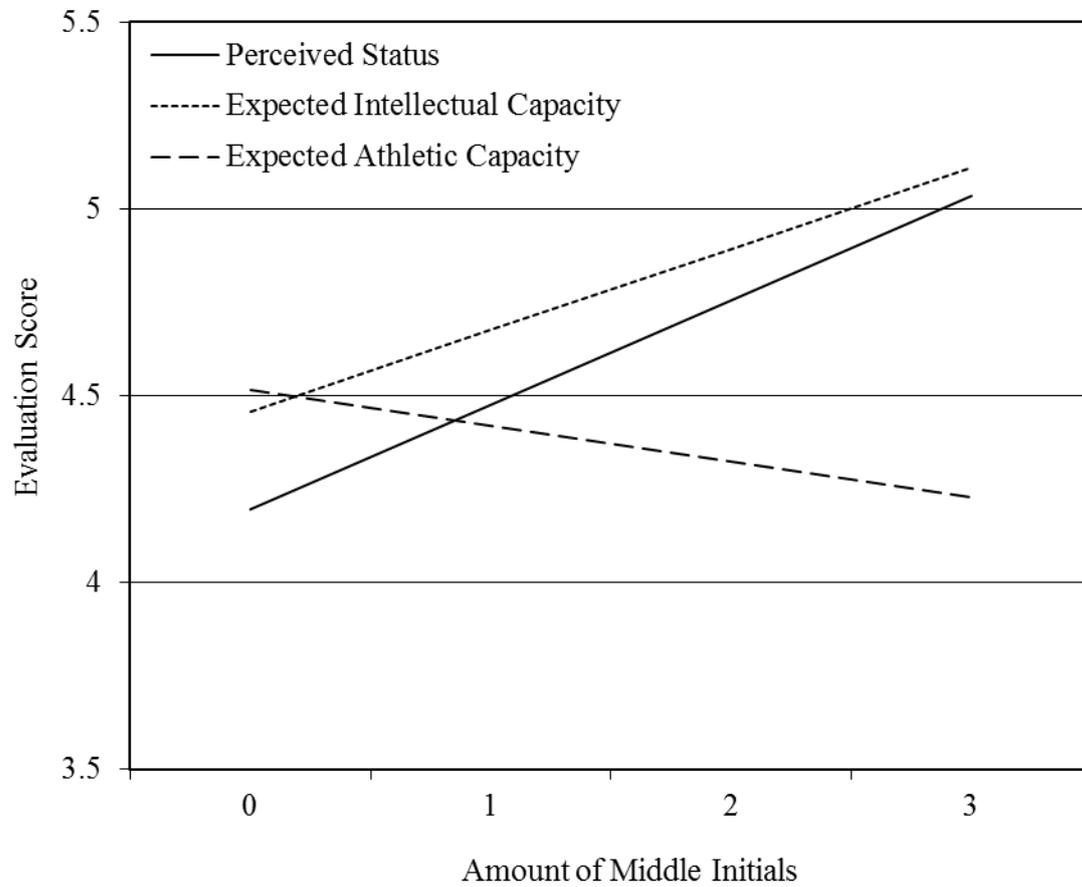


Figure 4a. Joining Preferences as a Function of Middle Initials (Study 7).

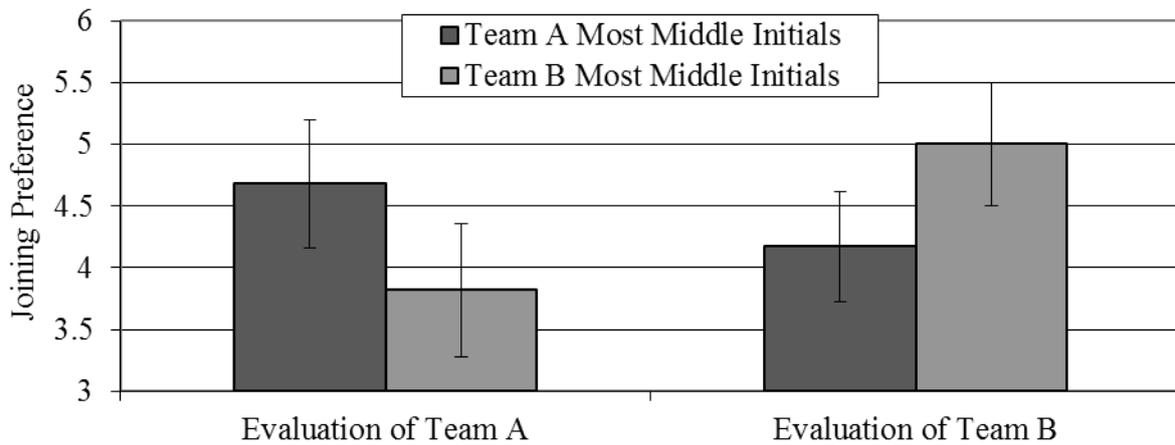


Figure 4b. Perceived Status in Teams as a Function of Middle Initials (Study 7).

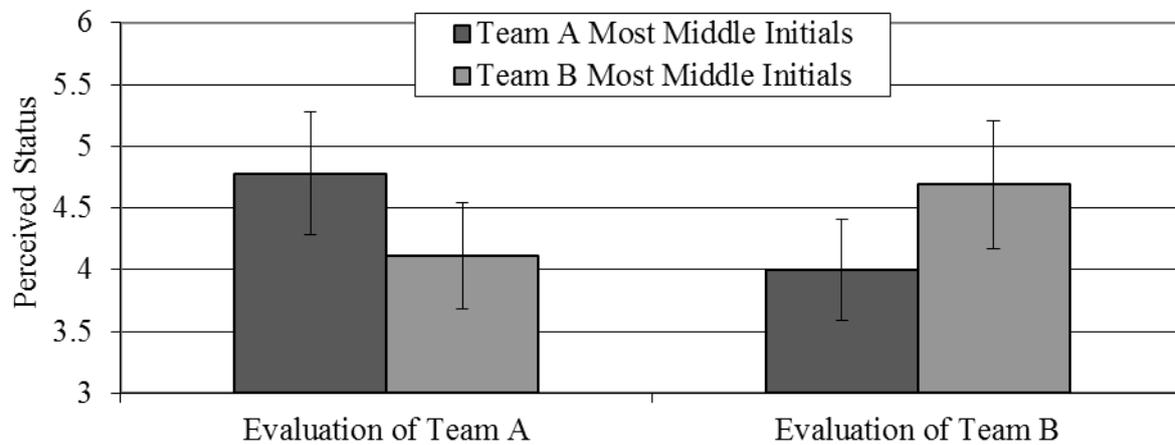
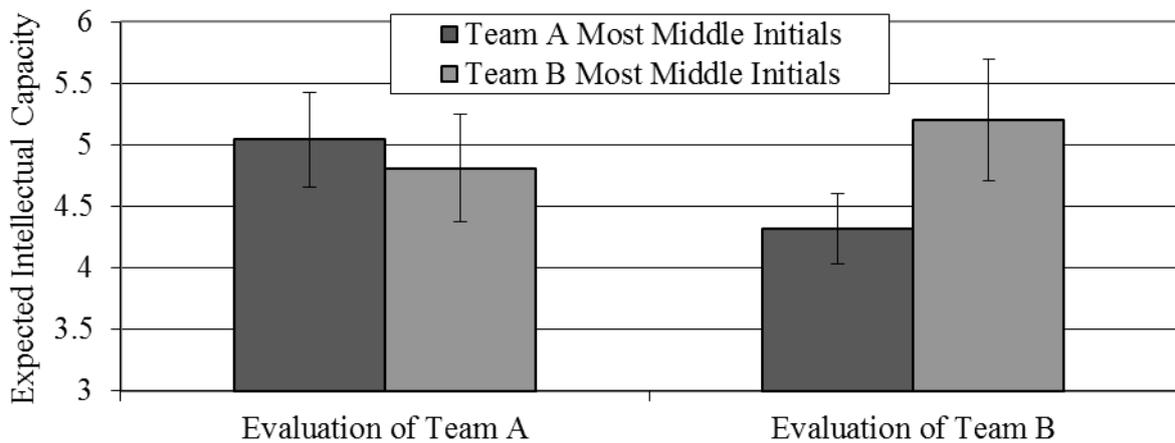
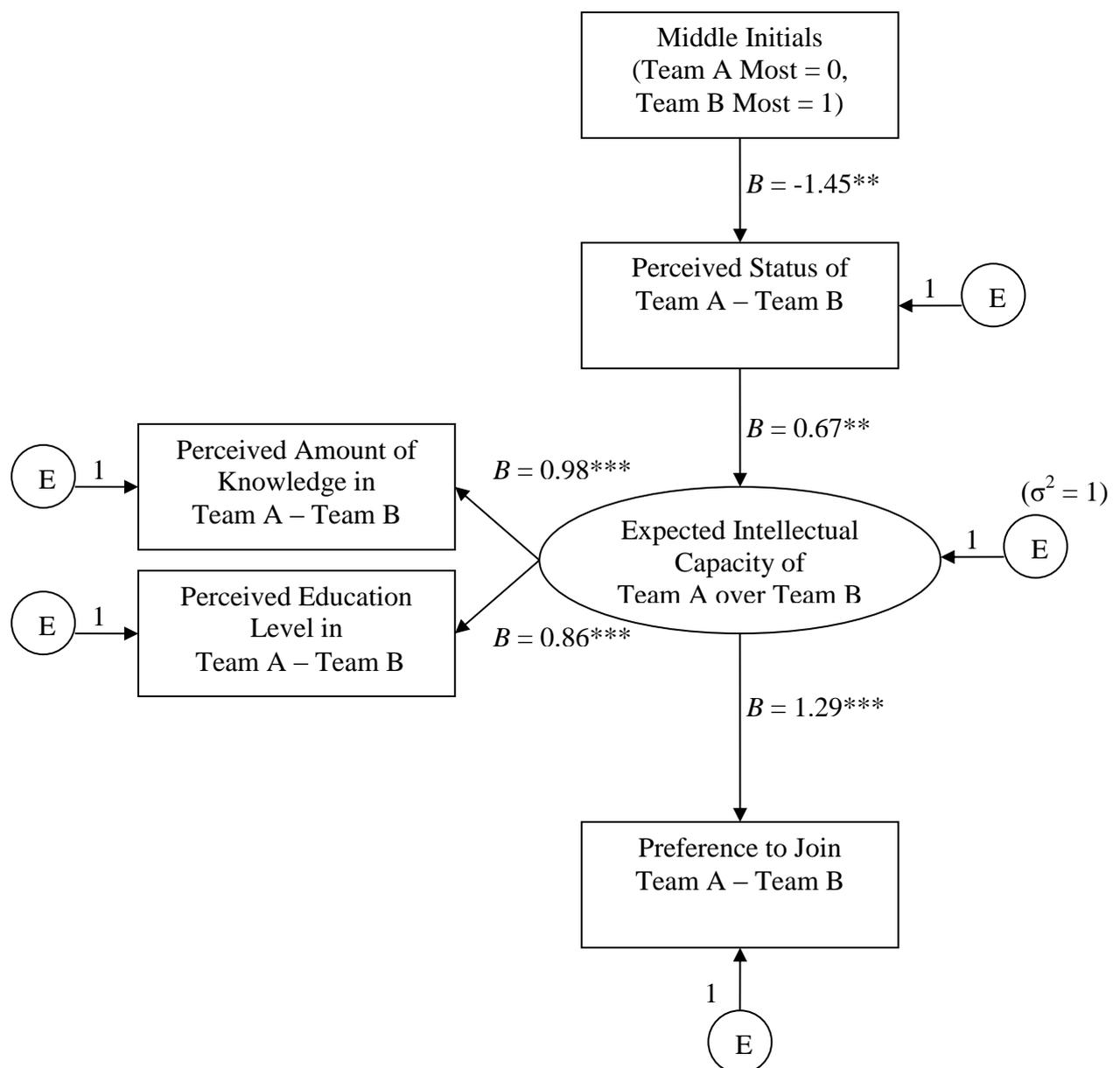


Figure 4c. Expected Intellectual Capacity in Teams as a Function of Middle Initials (Study 7).



Note: Error ranges indicate the 95% confidence intervals

Figure 5. Structural Equation Model on Initials, Status, Joining Preferences, and Expected Intellectual Capacity (Study 7).



Structural equation model on initials, status, intellectual capacity, and joining preferences fitted to the data of Study 7. Direct and indirect effect estimates were derived using a bias-corrected bootstrap method (Efron, 1987) employing 5,000 bootstraps. All 7 possible indirect (i.e. mediated) effects were significant at the .01 level.  $** p < .01$ ,  $*** p < .001$ .  $\chi^2(5) = 4.55$ ,  $p = .47$ ,  $RMSEA = .00$ ,  $TLI = 1.00$ ,  $CFI = 1.00$ .