

It's Personal: An Exploration of Students' (Non) Acceptance of Management Research

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Management educators often assume that research-based arguments ought to be convincing to students. However, college students do not always accept even well-documented research findings. Among the reasons this might happen, we focus on the potential role of psychological mechanisms triggered by scholarly arguments that affect students' self-concepts, leading them to engage in self-enhancing or self-protective responses. We investigated such processes by examining students' reactions to a research argument emphasizing the importance of intelligence to job performance, in comparison to their reactions to research arguments emphasizing the importance of emotional intelligence or fit. Consistent with our predictions, students were less likely to accept the argument for the importance of intelligence compared to the alternative, less threatening, arguments (i.e., the importance of emotional intelligence or fit). Further, acceptance of the argument about the importance of intelligence was affected by students' grade point average (GPA) and moderated by their emotional stability. Specifically, consistent with self-enhancement theory, students with lower GPAs were more likely to reject the argument for intelligence and give self-protective reasons for their responses, whereas students with higher GPAs were more likely to accept the argument and give self-enhancing reasons. Implications for future research and for management teaching are discussed.

The quest for a scientific approach to management has made rationality a pervasive paradigm and aspiration in both the theory and practice of management. This remains true despite known

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limitations associated with a strict rationality-based perspective (e.g., Sandberg & Tsoukas, 2011), as well as calls to recognize the importance of emotions and intuition in both management and management education (e.g., Brief & Weiss, 2002; Hogarth, 2001; Parikh, 1994; Sadler-Smith & Shefy, 2007; Sinclair & Ashkanasy, 2005; Vince, 2002).

Indeed, the fact that evidence stemming from a scientific rationality approach is not always accepted at face value is hardly news (Highhouse, 2008; Rynes, Colbert, & Brown, 2002). Members of juries commonly disregard large-sample statistical

evidence in favor of personal stories or anecdotes (Bornstein, 2004; Loftus, 1980). According to Gallup polls, substantial proportions of Americans do not believe scientific evidence about global warming and climate change (Jones, 2011; Newport, 2010). And more than 200 years after Darwin's birth, only 39% of Americans believe in the theory of evolution (Newport, 2009).

Closer to the management discipline, considerable research suggests that managers do not always adopt prescriptions from organizational research (Hakel, 1982; Johns, 1993; Pfeffer & Sutton, 2006). For example, Highhouse (2008) reviewed multiple studies showing that statistically modeled predictions of employee behavior are superior to both intuitive methods (such as unstructured interviews) and combinations of statistical *plus* intuitive methods. Nevertheless, the unstructured interview continues to be the most popular and widely used selection procedure today, as it has been for more than 100 years (Buckley, Norris, & Wiese, 2000; Dana, Dawes, & Peterson, 2012). The fact that managers, jurors, and the general public reject at least some research findings suggests that calling on research evidence may be insufficient for influencing students' beliefs.

One reason people might not accept research-based arguments is that they hear contradictory research arguments all the time: There is, or is not, global warming; global warming is, or is not, caused by human actions; eating dairy products is, or is not, good for you; money is, or is not, the most effective motivator, wealth created by lower taxes for the rich does, or does not, "trickle down" to the poor, and so on. Such contradictions are equally common in the management literature (Dipboye, 2014; Pfeffer & Sutton, 2006). The fact that even scientists often do not agree on research evidence increases the likelihood that students (and managers) treat research findings more like research "arguments," which they are then free to either accept or reject.

It is also likely that psychological mechanisms related to the self-concept play a role in student reactions to research arguments. Studies have shown that people often engage in motivated reasoning, both consciously and unconsciously, when they evaluate information. For example, studies of cultural cognition have shown that people's cultural values or worldviews shape their beliefs about, and acceptance of, scientific consensus (Kunda, 1990; Kahan & Braman, 2006), such as the recent conclusions on climate change and on the effectiveness of the human papillomavirus vaccine (Kahan, Braman,

Cohen, Gastil, & Slovic, 2010; Kahan, Jenkins-Smith, & Braman, 2011). Specifically, people's responses are not only cognitive; their appraisals of self-relevant information are based on emotional reactions as well (Hepper, Gramzow, & Sedikides, 2010; Leary, 2007; Peters, Burraston, & Mertz, 2004; Sedikides & Skowronski, 2012).

Dunning (1999) and others (Alicke & Sedikides, 2011a; Dufner et al., 2012) have shown that people respond to self-relevant information in a way that enhances or protects their self-concept. Reactions may include self-enhancing responses to affirmative information and self-protective responses to threatening information (Alicke & Sedikides, 2011a), as both responses help to protect and maintain positive self-concepts (Dufner et al., 2012).

In spite of considerable social science research (summarized in Alicke & Sedikides, 2011b) showing that self-related processes play a role in a wide range of persuasive attempts, the role of such processes has received little attention in management education. Recently, however, management scholars have begun to note the importance of self-concepts and identities in the learning process. Trank (2014: 385) draws attention to the fact that the way students read academic texts is influenced by their "baggage in the form of biography and identity, along with needs that are local and immediate." Pfeffer and Sutton (2006) refer to idiosyncratic personal histories as barriers to adoption of evidence-based management. In their book on developing management skills, Whetten and Cameron (2011) caution that management development work might at times be self-threatening and trigger a range of self-defense mechanisms. In the context of classroom learning, Lund Dean and Jolly (2012) explore self-defense mechanisms in a theoretical model of identity-based student disengagement, including such tactics as "confronting coping" (e.g., openly "attacking" the learning activity or the professor) and "distancing" (e.g., not participating or not engaging with the learning activity). However, students' reactions to particular research findings or learning materials have not been fully explored.

Many management theories and findings have significant potential to become "personal," or "self-relevant." Whereas learning about topics such as physics or chemistry involves understanding phenomena that are external to the individual, learning about management, individual correlates of performance, or characteristics associated with success means learning about topics that often have direct implications for the individual. That is, individuals

define themselves in terms of a variety of characteristics that are commonly discussed in management classes, including demographics, traits, abilities, attitudes, and personal styles. Reference to situations, contexts, or dynamics that resemble students' circumstances may also give personal meaning to a broad range of theories. Last but not least, students (who later become employees and managers) may identify with the employees and managers portrayed in management theories (see also Trank, 2014) and, as such, be likely to evaluate theories presented not only from an independent observer or learner standpoint, but also as *the subject* of the theory.

We contribute to this emerging line of inquiry by empirically exploring how students react to a particular research argument that may affect a certain aspect of their self-concept, in comparison to research arguments that are less likely to do so. More specifically, we examine students' agreement with a scholarly argument that intelligence is the best predictor of job performance, compared to arguments that either emotional intelligence or fit are the best predictors. We propose that an argument emphasizing the importance of intelligence may threaten some students' academic self-concepts, whereas this is less likely to be the case with the other two arguments.

The *academic self-concept* refers to students' "knowledge and perceptions about themselves in achievement situations" (Bong & Skaalvik, 2003: 6) and includes both cognitive and affective components (Kornilova, Kornilov, & Chumakova, 2009). As with other dimensions of the self, the academic self-concept is particularly susceptible to self-enhancing and self-protecting mechanisms (e.g., Trautwein, Lüdtke, Köller, & Baumert, 2006). Indeed, conceiving of oneself as smart and academically competent almost unanimously engenders a positive emotional response, while the opposite is true with respect to a negative academic self-concept (Covington, 1984a, 1984b, 1992). Thus, a research-based argument that touches on issues pertinent to students' academic self-concepts can be a sensitive, personal matter to them.

We focus on the impact of a research argument about intelligence for a number of reasons. First, intelligence is of considerable interest to employers in their hiring decisions (Dewan, 2014; Schmidt, 2009), and thus, of interest to students as well. Students know that they will almost certainly face a hiring process at various points in their lives; therefore, the topic of what predictors employers

should use to predict job performance in hiring is important to them. Second, students' academic performance is constantly measured: Not only have they taken exams to get into college, but they also get grades in each class they take. As such, students have clear, salient signals of where they stand on academic success (which is often defined as "being smart") and are constantly aware of and motivated by their grades (e.g., Van Etten, Pressley, McInerney, & Liem, 2008). Indeed, extensive evidence shows that students' grade point average (GPA) is highly correlated with their academic self-concept (Choi, 2005; Kornilova et al., 2009; Marsh, 1987; Marsh & Martin, 2011; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005). As such, this context allows us to explore a potential link between students' academic self-concept (which is relevant to the argument connecting intelligence and performance) and their acceptance of the argument about intelligence. Third, the argument about the importance of intelligence in job performance is a good example of a management argument that is supported by extensive empirical evidence (e.g., Ree, Earles, & Teachout, 1994; Schmidt & Hunter, 1998; Schmidt, 2009). Although the alternative arguments (emphasizing the importance of emotional intelligence and fit) have also begun to accumulate some support (e.g., Côté & Miners, 2006; O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011), this evidence is not nearly as extensive as that in support of intelligence.

Although establishing the validity of the three arguments about the predictors of success is important, that is not our objective here. For the purpose of this study—that is, exploring whether students evaluate research arguments using self-related processes—we are particularly interested in the potential "threat" these arguments may represent to the students' academic self-concept. The argument about intelligence implicitly places people in "winner" and "loser" camps, whereas emotional intelligence and fit arguments allow chances of success for a wider population (e.g., emotional intelligence is believed to be more malleable, and fit suggests that everyone could be successful in the right environment). We link students' agreement with arguments about predictors of success to their GPA (as a proxy for academic self-concept), and also explore the moderating role of emotional stability, which may buffer the sensitivity associated with potentially threatening information. As such, we are able to document (both quantitatively and qualitatively) the importance of self-enhancement and

self-protection processes in students' reactions to the presentation of research arguments.

CONCEPTUAL FOUNDATIONS AND HYPOTHESES

Considerable socio-psychological research has delineated reasons people may respond positively or negatively to information presented to them (e.g., Dunning, 1999; Kahan et al., 2011; Sedikides & Skowronski, 2012; Steele, 1988; Webb, Chang, & Benn, 2013). A major stream of research explaining such responses focuses on the importance of avoiding threats to the self in interpreting persuasive messages and other information (e.g., Alicke, LoSchiavo, Zerbst, & Zhang, 1997; Jacks & O'Brien, 2004; Sedikides, 2012). Put another way, the extent to which any message or information (such as the presentation of an argument based on research evidence) threatens or bolsters an individual's (academic) self-concept appears to be an important determinant of whether the information will be accepted. Threatening information is likely to generate negative emotions that cause people to protect themselves by using "hot" (i.e., emotional or motivated), rather than "cold" (i.e., analytical and logical) cognition (Abelson, 1963; Kunda, 1999).

Theories of self-enhancement and self-protection (Alicke & Sedikides, 2011b) suggest that individuals' motivation to maintain a positive self-concept and to avoid negative views of themselves (Hepper et al., 2010; Leary, 2007) leads them to respond to events and information using strategies that either enhance or protect their self-concept. Cognitive strategies to accomplish self-enhancement in response to affirming statements (Hepper et al., 2010: 783–784) include, among others, playing up the importance of that ability or area of life, attributing success to the self, accepting positive statements as accurate, and sometimes exaggerating them (Gramzow, Johnson, & Willard, 2014). Cognitive strategies to accomplish self-protection in response to threatening statements (Hepper et al., 2010: 784–785) include, among others, attributing failure to external causes, rejecting threatening statements as invalid or inaccurate (Greenwald, 2002), self-handicapping, and defensive pessimism (Seli, Dembo, & Crocker, 2009).

Consistent with the above theories, previous research has shown that many people reject arguments suggesting that intelligence plays a predominant role in predicting job performance and other life outcomes, such as salary and career attainment (e.g., Kuncel, Hezlett, & Ones, 2004; Kuncel

& Hezlett, 2010; Pinker, 2002; Snyderman & Rothman, 1988). A variety of reasons for the unpopularity of this idea have been discussed, some of which seem to have a basis in threats to the self. For instance, the literature on self-regulation emphasizes the importance of three self-related goals: agency, esteem, and affiliation (DeSchon & Gillespie, 2005). For some students, the argument for intelligence may be problematic particularly in relation to the first two goals.

More specifically, about 40% of people operate under the false belief that intelligence is virtually almost entirely "fixed," not malleable or subject in any way to individual control (Dweck, 1986, 2008). In contrast, writings about emotional intelligence focus more on ways of improving it (e.g., Goleman, 1998; Salovey, Mayer, Caruso, & Yoo, 2002), and writings on fit suggest that there are multiple different environments in which individuals might find a fit (e.g., Cable & Judge, 1996; Kristof, 1996). This is important both in terms of the agency goal (the motivation to achieve and maintain a perception of control over important aspects of the environment), and in terms of the esteem goal (the motivation to achieve and maintain a positive self-image). People are likely to prefer claims that bolster their sense of control and mastery (Giluk & Rynes, 2012), or claims that are less specific or more permissive toward the formulation of a positive self-image (i.e., emotional intelligence is less specific in terms of a definite level of mastery, and the argument for fit provides more options for self-validation). As such, the argument emphasizing the role of intelligence in job performance (herein referred to as *the argument for intelligence*) is likely to be more threatening, especially in comparison to arguments emphasizing the importance of emotional intelligence and fit (herein referred to as *the argument for emotional intelligence*, and *the argument for fit*). Thus, we propose as a baseline hypothesis:

Hypothesis 1: Students are less likely to accept the argument for intelligence than the arguments for emotional intelligence or fit.

Showing that the argument emphasizing the importance of intelligence has, on average, a higher potential for self-threat than do arguments emphasizing the importance of emotional intelligence or fit is important for our study. But lower acceptance of the argument for intelligence would not by itself demonstrate that the reason is rooted in self-threat. As such, we focus next on relationships between the

academic self-concept and acceptance of the argument for intelligence.

As we have indicated above, the argument for intelligence should not be equally threatening to everyone. That is, in relation to the aforementioned esteem goal, information emphasizing intelligence as a predictor of performance should be self-affirming to students who typically do well on assessments of intelligence or ability and self-threatening to those who do not. Similarly, from an agency goal perspective, students who do well on intelligence assessments may feel that they have more control over the outcome of a selection process based on such assessments than those who have not obtained good results on related assessments. These goals are important in general, but in the academic context they are especially relevant to a particular facet of the self, defined as the academic self-concept.

As noted before, the academic self-concept refers to "individuals' self-concepts that are formed specifically toward an academic domain" (Kornilova et al., 2009: 597), or "knowledge and perceptions about themselves in achievement situations" (Bong & Skaalvik, 2003: 6). Existing studies show that the academic self-concept is related to students' GPAs (Choi, 2005; Kornilova et al., 2009; Marsh, 1987; Marsh & Martin, 2011; Marsh et al., 2005); test anxiety (Zeidner & Schleyer, 1999; Urhahne, Chao, Florineth, Luttenberger, & Paechter, 2011); and pursuit of further academic challenges (Marsh & O'Mara, 2008; Marsh & Yeung, 1998). Students having a positive academic self-concept are likely to find information emphasizing intelligence as a predictor of performance less threatening, whereas, given the anxiety it provokes, those having a negative academic self-concept may find it more threatening.

The most salient indicator of academic self-concept for students is their academic performance, as captured in grades or GPA (cf. Choi, 2005; Kornilova et al., 2009; Marsh, 1987; Marsh & Martin, 2011; Marsh et al., 2005). Meta-analytic studies (e.g., Valentin, DuBois, & Cooper, 2004; Huang, 2011) have shown that there is a reciprocal relationship between GPA and academic self-concept (Marsh & Craven, 2006), and other studies have shown that achievement (e.g., GPA), due to its salience, is more directly linked to self-concept than is actual cognitive ability (Chen, Hwang, Yeh, & Lin, 2011). In other words, regardless of their actual cognitive ability, students with high GPAs are the ones with a positive academic self-concept, and therefore, the ones likely to relate positively to arguments emphasizing

the importance of cognitive ability. In contrast, students with low GPAs, regardless of their cognitive ability, are likely to experience a negative academic self-concept and perceive information emphasizing cognitive ability as a threat: Their job prospects will be jeopardized if intelligence is used as a predictor of job performance. Students with high GPAs are more likely to find the argument for intelligence to be self-affirming, giving them a sense of agency and high self-esteem, whereas those with low GPAs are more likely to find it threatening (e.g., Greenwald, 2002; Möller & Pohlmann, 2010; Sedikides & Gregg, 2008; Sedikides, 2012). Thus, we propose:

Hypothesis 2: There will be a positive relationship between students' GPAs and their acceptance of the argument for intelligence.

We have suggested above that students should, in general, find the argument for intelligence more threatening than the arguments for emotional intelligence and fit, and we have also suggested that students with lower GPAs (or lower academic self-concepts) should find the argument for intelligence more threatening than do students with higher GPAs (or higher academic self-concepts). If indeed the mechanisms behind these connections are related to self-threat, as we have argued, it is also reasonable to expect that students' GPAs will have a greater impact on acceptance of the argument for intelligence than on the arguments for emotional intelligence and for fit: GPA is directly relevant to agency and esteem goals in the context of the argument about intelligence, but less so in the context of the arguments about emotional intelligence and fit, which emphasize other aspects. Consequently, we propose that:

Hypothesis 3: The impact of GPA on acceptance of the argument for intelligence will be stronger than its impact on the arguments for emotional intelligence and fit.

Besides the impact of GPA, students' responses to research arguments may also be influenced by a more general predisposition to interpret such information as threatening. One of the most widely studied personality traits, emotional stability (Judge, van Vianen, & De Pater, 2004), refers to individuals' tendency to remain calm and even-tempered in stressful situations. It "reflect[s] the tendency to be confident, secure, and steady" (Judge & Bono, 2001: 80) and is the polar opposite of

neuroticism, which involves being “anxious, emotional, nervous and tense” (De Feyter, Caers, Vigna, & Berings, 2012: 440). People who are emotionally stable tend to be less worried than others and are less likely to focus on negative aspects of information given to them (Bell & Arthur, 2008). Studies show that emotional stability is negatively related to sensitivity to threat cues, triggering comparatively few self-protection biases (Nurmi, 1993; Ross, Canada, & Rausch, 2002). It is also positively related to self-esteem (Dufner et al., 2012; Schröder-Abé, Rudolph, & Schütz, 2007) and negatively related to the tendencies of self-enhancement, narcissism, and self-deceptive enhancement (Paulhus & John, 1998). Thus, high emotional stability should lower the perceived threat of the argument that presents intelligence as an important predictor of job performance. As such, we propose:

Hypothesis 4: Emotional stability will moderate the relationship between students’ GPA and acceptance of the argument for intelligence such that when emotional stability is low, the impact of GPA on acceptance will be more pronounced than when emotional stability is high.

The overall theoretical framework and the specific proposed relationships are summarized in Figure 1.

In addition to the quantitative testing of the hypotheses presented in the model, we also use the qualitative data to conduct a more detailed analysis of whether and how acceptance of the argument for intelligence is associated with self-enhancement

and self-protective mechanisms. We detail this procedure in the next section.

METHODS

Participants

Participants were 370 undergraduate students enrolled in an introductory management class in the business school of a Midwestern United States public university. Students took this class as a requirement for the management major or as a prerequisite for certain organizational behavior or human resource-related classes. The study was conducted at the beginning of the semester, and students received extra credit for their participation. None of the authors were instructors in these classes. The sample was 53% male and ethnically homogenous (the undergraduate business school population at the time of data collection was less than 2% non-Caucasian).

Procedure

Participants signed up for two sessions. They were told that the study involved assessing their beliefs about three research-based views with regard to personal traits or characteristics that are important in predicting the job performance of new hires. In addition, they were told that they would have the opportunity to take a variety of psychological assessments, some of which are sometimes used by employers in the hiring process (e.g., a Big-Five personality inventory).

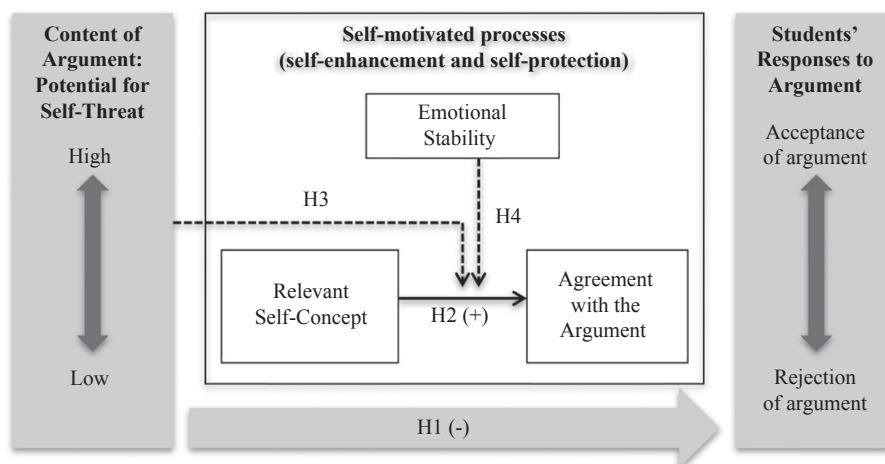


FIGURE 1

The Self-Motivated Processes Model: Explaining the Relationship Between the Content of Argument (i.e., Self-Threat Potential) and Students’ Responses

In the first session, participants completed a web-based survey containing measures of emotional stability, along with the other Big-Five dimensions and demographics (i.e., gender, age, and year in school). These additional variables (except gender, as explained later) were not expected to be associated with reactions to the essays, but were included to reduce the salience of the emotional stability measure and of our request for access to grades. Participants could log onto the survey at any time.

Two weeks after completing the first session, participants were sent individual e-mails giving them access to the second part of the survey. In this session, they read three 1-page research-based essays about how to hire the highest performing employees (detailed below in the Stimulus Materials section). Participants were informed that each essay had been written by an academically trained researcher, although authors' names were not provided to avoid possible confounding by potential differences in author name recognition. Participants were randomly assigned to one of three equivalent-size groups corresponding to three order conditions (the essay about intelligence was read either first, second, or third). After reading each essay, participants answered five questions about the extent of their agreement with the essay. We also asked them to indicate whether they thought employers ought to test for the trait or characteristic described in the essay and to explain why in an open-ended question.

Stimulus Materials

The target essay, entitled "Select for Intelligence," was excerpted from pages 3–5 of Schmidt (2009). This essay appeared as the lead article in an edited volume designed to inform managers about the practical implications of research findings in various areas of organizational behavior and human resource management (Locke, 2009). The second essay, "Select for Emotional Intelligence," was excerpted from pages 3–4 and 18–19 of Goleman's (1998) *Working With Emotional Intelligence*, a book designed for managerial audiences. The final essay, "Select for Fit," was excerpted from pages 71–73 of Pfeffer's (1998) *The Human Equation: Building Profits by Putting People First*. The essays are included in Appendices 1 to 3.

Essays were edited to be nearly identical in length, ranging from 619–664 words. They were also purged of any statistics or numerically based arguments because one essay did not include any

statistics and the statistics provided in the other two essays were not comparable with one another.

In addition, we ran a readability test for each of the three essays. Readability is a statistically derived index of probable difficulty in understanding written text (Klare, 1974). As shown in Table 1, the readability scores for our essays are between 38.1 and 56 (out of 100), with corresponding grade levels (i.e., equivalent number of years of education for a certain readability level) between 10.8 (the argument for emotional intelligence) and 14.7 (the argument for fit), or between 10th grade and second year of college in the U.S. system (Flesch, 1948; Kincaid, Fishburne, Rogers, & Chissom, 1975). Thus, the difficulty of the essays was appropriate for our audience.

Measures

Independent Variables

As noted earlier, we used the *university grade point average* (GPA) as an indicator of students' academic self-concept (cf., Choi, 2005; Kornilova et al., 2009; Marsh, 1987; Marsh & Martin, 2011; Marsh et al., 2005). We used official GPAs provided by the university registrar, as research has shown that there are overreporting problems (especially among students who have low GPAs) with self-reported GPAs (Kuncel, Credé, & Thomas, 2005). Most likely this overreporting problem is related to the aforementioned argument that GPA is important to students as it relates to their academic self-concept: Kuncel et al. suggested a possible link between the issue of overreporting and students "protecting their pride or self-respect" (2005: 77). In our sample the 317 students who gave permission to obtain their scores had higher GPAs as a group ($M = 3.04$, $SD = .52$) than the 53 students who didn't ($M = 2.77$, $SD = .46$; $t = 3.55$;

TABLE 1
Readability Tests for the Three Essays Presenting the Theoretical Arguments Used as Stimuli

Essay	Flesch-Kincaid reading ease ^a	Flesch-Kincaid grade level ^b
The argument for intelligence	45.3	11.2
The argument for emotional intelligence	56.0	10.8
The argument for fit	38.1	14.7

^a Index varies between 0 and 100, with higher scores indicating easier readability.

^b Grade levels over 22 indicate graduate-level text.

$p = .000$, $d = .55$).¹ The fact that those with lower GPAs were less likely to give access permission suggests that indeed students may be concerned about potential connotations associated with their GPA.

Emotional stability was measured using the 10-item scale from the Big-Five broad domains in the International Personality Item Pool (Goldberg et al., 2006). We used a 7-point rating system (from 1 = "strongly disagree" to 7 = "strongly agree"), and the negatively worded items were reverse coded; therefore, a higher score indicates higher emotional stability. The coefficient alpha for this scale was .88.

Dependent Variables

We assessed whether respondents *agreed with each argument* by asking them to indicate the extent of their agreement (on 5-point scales) with six items: "What the author says makes a lot of sense to me; I agree with nearly everything the author says; Organizational performance would improve if more employers used this information; This is important information for managers to have; The author's arguments were clear and convincing; and It is hard to disagree with what the author said." Coefficient alphas for this measure were .89, .88, and .86, respectively, for the three arguments for intelligence, emotional intelligence, and fit.

As noted earlier, we also asked students whether they thought employers should test job applicants for each of the key predictors, and asked them to explain in writing why they answered the way they did. This provided us with qualitative data that were subsequently content analyzed, as will be discussed below.

Control Variables

Because of the pervasiveness of framing and anchoring effects (Tversky & Kahneman, 1981), we controlled for the order in which the three essays were read (i.e., the intelligence essay read first,

second, or last in the sequence). We also controlled for participant *gender*, since earlier research demonstrated gender differences in self-estimates of intelligence (Furnham & Buchanan, 2005).

ANALYSIS AND RESULTS

Table 2 shows the means, standard deviations, and correlations among the variables. The correlation matrix suggests that agreement with the argument for intelligence is significantly correlated ($r = .18$; $p = .000$) with GPA, whereas agreement with the arguments for emotional intelligence and fit ($r = .06$; $p = .234$ and $-.07$; $p = .199$, respectively) are not. Agreement with the arguments about emotional intelligence and fit are significantly correlated with each other ($r = .30$; $p = .000$), but not with agreement for the argument about intelligence ($r = .07$; $p = .210$ and $.02$; $p = .640$, respectively). The correlations between the control variables (gender and order) and acceptance of the argument for intelligence suggest that gender and order may influence the relationships hypothesized in the case of that particular argument, but not for the other two arguments.

Hypothesis Testing: Quantitative Results

Because we assessed each student's reaction to three different essays (i.e., repeated measures nested within a given individual), we tested our hypotheses using hierarchical linear modeling (Raudenbush & Bryk, 2002). Hypotheses 1 and 2 could be tested using simpler approaches, such as regression analysis or repeated measures ANOVA. However, multilevel modeling is particularly helpful in testing Hypotheses 3 and 4, because we need to account for the nesting of reactions to essays within a given individual (which is not possible when using regression analysis), and because we have moderators that are continuous variables (which limits the use of ANOVA). More precisely, we wanted to model both the effect of the content of the essays on agreement and how this effect varies as a function of continuous predictors such as GPA and emotional stability.

The use of multilevel modeling also allowed us to align the analyses with our focus on reactions to the argument for intelligence compared to reactions to the other two arguments (i.e., emotional intelligence and fit), a comparison that is essential to our theoretical argument. For that purpose, we created a contrast variable, *content of argument*, defined as "the argument for intelligence versus the arguments

¹ The registrar calculated the mean and standard deviation of GPA scores for those who did not give permission, which did not violate these students' privacy but gave us information about GPA differences between the permission and nonpermission groups. For purposes of subsequent analyses, we used actual GPAs where available, and the mean of the missing GPAs (i.e., 2.77) for students in the nonpermission group. As a supplementary check, we have also explored effects on the sample without the replaced missing values, and the pattern of findings was the same.

TABLE 2
Means, Standard Deviations, and Correlations ($N = 370$)

Variable	<i>M</i>	<i>SD</i>	1	2a	2b	3	4	5	6	7
1. Gender ^a	.53	.50								
2a. Order: intelligence second ^b	.35	.48	.02							
2b. Order: intelligence third ^c	.32	.47	-.04	-.50**						
3. Emotional stability	4.12	.98	.08	.01	.04	(.88)				
4. GPA	3.01	.49	.04	-.05	.04	.03				
5. Agreement: the argument for intelligence	3.35	.81	.13*	.12*	-.06	.07	.18**	(.89)		
6. Agreement: the argument for emotional intelligence	3.73	.72	-.07	.03	.02	-.07	.06	.07	(.88)	
7. Agreement: the argument for fit	3.69	.65	-.05	-.04	.04	-.04	-.07	.02	.30**	(.86)

Note: α reliabilities are in parentheses on the diagonal.

^a 1 = male; 0 = female.

^{b,c} Dummy variables for the order in which the argument for intelligence was presented (second or third in the sequence).

* $p < .05$, ** $p < .01$

for emotional intelligence and fit." This variable was coded as "2" for the argument for intelligence, and "-1" for the other two arguments. To confirm that it was appropriate to set up the contrast variable in this way, we conducted a 1-way within-subjects (repeated measures) ANOVA followed by post hoc comparisons of agreement for each essay separately. This analysis also addresses Hypothesis 1 (somewhat superfluously, as the overall effect of content is tested in the multilevel model as well, yet the more detailed analysis helps verify how each of the three essays compares against the others taken one at a time). First, the overall ANOVA test confirmed a significant effect of essay content on agreement: Wilks' $\lambda = .875$, $F(2, 368) = 26.172$, $p = .000$. Next, the post hoc paired t tests indicated that there was a significant difference in agreement with the essay on intelligence ($M = 3.35$, $SD = .81$) as compared with the agreement on each of the other two essays (emotional intelligence: $M = 3.73$, $SD = .72$; $t = -6.92$, $p = .000$; $d = .50$ and fit: $M = 3.69$, $SD = .65$; $t = -6.34$, $p = .000$; $d = .46$). The tests also indicated there was no significant difference in agreement between the essays on emotional intelligence and fit ($t = .894$, $p = .372$; $d = -.05$). These

results suggest that indeed students agree less (in general) with the essay on intelligence compared to both the essay on emotional intelligence and the essay on fit. The mean differences between essays and their associated t tests are presented in Table 3. These findings, providing support for Hypothesis 1, are also consistent with our decision to set up the contrast variable the way we did.

The effect of essay content on agreement was reconfirmed in the null model in HLM (i.e., random effects ANOVA; Raudenbush & Bryk, 2002) where we determined how much of the variability was within-versus between-persons. Results indicated that 93.1% of the variance in agreement was within-individual variance ($\sigma^2 = .54$) and only 6.9% was between-individual variance ($\tau = .04$). This shows that the content of what was evaluated was a much greater source of variance than the characteristics of those who made the evaluation.

Subsequently, we ran an HLM random-intercept and random-slopes model for predicting agreement with the essay (outcome variable) based on our variables of interest: The content of argument contrast was entered as a predictor at Level 1 (Model 1), along with controls (gender and dummy variables

TABLE 3
Post Hoc Paired t Tests of Differences in Agreement Between Arguments ($N = 370$)

Arguments compared	Paired differences			t test	p value	Cohen's d
	<i>M</i>	<i>SD</i>	95% Confidence interval			
Emotional intelligence/Intelligence	.38	1.05	[.27, .48]	6.92	.000	.50
Fit/Intelligence	.34	1.03	[.23, .44]	6.34	.000	.46
Fit/Emotional intelligence	-.04	.81	[-.12, .05]	-.89	.372	-.05

for order, Model 2). Next, GPA and emotional stability (Models 3a and 3b) were entered as predictors at Level 2, followed by the addition of interactions between GPA and emotional stability (Model 4). The Level 1 predictor (content of argument) was centered around the group mean (i.e., within cluster) and Level 2 predictors were centered around the grand mean (cf. Enders & Tofighi, 2007; Hofmann & Gavin, 1998; Raudenbush & Bryk, 2002). To indicate the extent to which the added terms in each model help improve the model, we computed a Pseudo- R^2 (Snijders & Bosker, 1999) as the reduction in unexplained variance in the dependent variable for each model compared to the baseline model. The deviance statistic, which is an overall summary of the model fit (i.e., $-2 \log$ likelihood), also allows for comparing models (a decrease in deviance indicates an improvement in the model fit). The multi-level modeling allowed us to determine whether there was an overall effect of content on agreement (Hypothesis 1); whether there was a relationship between GPA and acceptance of the arguments (Hypothesis 2); whether the effect of GPA was stronger for intelligence than for the other two arguments (Hypothesis 3); and whether emotional stability moderated these relationships (Hypothesis 4). The results are presented in Table 4.

Table 4 shows that Hypothesis 1 was supported ($\beta_{\text{Content of argument}} = -.12, p < .001$; see Model 1). It also shows the value of our controlling for gender. Males were more likely to agree with the argument for intelligence than females ($\beta_{\text{Sex} \times \text{Contrast}} = .10, p = .003$, see Model 2). However, we did not find any evidence for an order effect.

Hypotheses 2 and 3 were also supported (Models 3a and 3b). In support of Hypothesis 2, the simple slope for GPA ($\beta_{\text{GPA}} = .20, p < .001$ based on Model 3a, and $\beta_{\text{GPA}} = .22, p < .001$ based on Model 3b), not reported in Table 4 but computed using the method described by Preacher, Curran, and Bauer (2006), suggests that GPA has an impact on agreement with the argument for intelligence: the higher the GPA, the higher the agreement. More important, in support of Hypothesis 3, the coefficients for GPA reported in Table 4 ($\beta_{\text{GPA} \times \text{Contrast}} = .10, p = .003$ in Model 3a and $\beta_{\text{GPA} \times \text{Contrast}} = .11, p = .001$ in Model 3b), suggest that the impact of GPA is more pronounced for the argument for intelligence than the arguments for emotional intelligence and fit (Hypothesis 3). A potential alternative explanation for the rejection of the argument for intelligence by students with lower GPAs might be that they did not understand the essay because of their lower cognitive ability. However, as discussed earlier, we can

TABLE 4
Results of the Hierarchical Linear Modeling

Model and effect	Model 1			Model 2			Model 3a			Model 3b			Model 4		
	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t
<i>Effect of content of argument on agreement</i>															
Intercept	3.59	.02	164.10***	3.55	.05	71.12***	3.55	.05	71.36***	3.57	.05	68.16***	3.57	.05	68.23***
Content of argument ^a	-.12	.02	-7.70***	-.19	.03	-5.61***	-.18	.03	-5.53***	-.16	.03	-4.64***	-.16	.03	-4.69***
<i>Controls</i>															
Order: second ^b				.06	.04	1.56	.06	.04	1.64	.07	.04	1.77	.06	.04	1.62
Order: third ^c				-.02	.04	-0.37	-.02	.04	-0.50	-.02	.04	-.38	-.01	.04	-.36
Sex ^d				.10	.03	2.96**	.09	.03	2.74**	.09	.03	2.75**	.08	.03	2.68**
<i>Cross-level effects (individual variables x content of argument) on agreement</i>															
GPA							.10	.03	3.01**	.11	.03	3.20**	.03	.04	.68
ES ^e linear							.03	.02	1.54	.02	.02	1.51	.02	.02	1.48
ES quadratic										-.03	.01	-1.89*	-.03	.01	-2.00*
<i>Interactions effects (interaction of individual variables x content of argument) on agreement</i>															
GPA x ES linear													-.00	.03	-.05
GPA x ES quadratic													.07	.03	2.66**
Deviance ($-2 \log$ likelihood)						2386.01			2370.44			2364.96			2356.68
Pseudo R^2						.07			.14			.16			.20

Note: $N = 370$; ^a Content of argument (contrast) was coded 2 for the argument for intelligence and -1 for the arguments for emotional intelligence and fit; ^{b,c} Dummy variables for the order in which the argument for intelligence was presented (second or third in the sequence); ^d 1 = male, 0 = female; ^e ES = Emotional Stability; Pseudo R^2 indicates the model improvement in terms of reduction of unexplained variance in agreement compared to the baseline model.

* $p < .05$, ** $p < .01$, *** $p < .001$

rule out this explanation because the argument for intelligence was not the most difficult essay to read (see Table 1). Also, whereas students with low GPAs are less likely to agree with the argument for intelligence, this is not the case when it comes to responding to the other two arguments; nor is it the case for students with high GPAs. This strongly suggests that it is the content of the argument, and not the cognitive capacity of the students, that is the cause of lower agreement with the argument for intelligence for students with low GPAs.

Hypothesis 4, which proposed a moderating role for emotional stability, was not supported in our initial testing ($\beta_{ES \text{ linear} \times \text{Contrast}} = .03, p = .124$, see Model 3a). However, given the strong theoretical justification that emotional stability should matter, we explored further into its potential role.

Recent studies have described the “too-much-of-a-good-thing” effect (Pierce & Aguinis, 2013) as a general metatheoretical principle in management. Applied to the present situation, this principle would suggest that average levels of emotional stability might better mitigate the felt need to self-protect not only compared to lower levels, but also compared to higher levels of emotional stability. Beneficial traits (as in our case, emotional stability) can reach inflection points after which their positive effects are lost or turn negative. For example, Le et al. (2011; also see Pierce & Aguinis, 2013) demonstrated a curvilinear relationship between personality dimensions (including emotional stability) and performance, suggesting that there is an optimal midrange level of this personality dimension for maximum performance.

Following this logic, we revisited our Hypothesis 4 and explored the potential moderating effect after adding a quadratic term for emotional stability (Model 3b), and the corresponding interaction terms (Model 4). Results showed a marginally significant curvilinear effect of emotional stability on agreement with the arguments ($\beta_{ES \text{ quadratic} \times \text{Contrast}} = -.03, p = .059$, Model 3b), as well as a significant curvilinear effect with the interaction between GPA and agreement with the arguments ($\beta_{GPA \times ES \text{ quadratic} \times \text{Contrast}} = .07, p = .008$, Model 4). That is, emotional stability moderated the effect of GPA on agreement with the various arguments, and this effect differed for each argument. These findings are best portrayed using the graphical representation in Figure 2, where we plotted the agreement for each argument at different levels of GPA and emotional stability (within one standard deviation below and above the mean).

Figure 2 illustrates all the effects reported above. First, it shows that students in general agree more with the arguments for emotional intelligence and fit than with the argument for intelligence (H1). Second, it shows that the level of agreement with the argument for intelligence is clearly lower for students with low than those with high GPA (H2). Third, it shows that there is a more pronounced difference between how students with low and those with high GPA react to the argument for intelligence compared to how the two groups react to the arguments for emotional intelligence and fit (H3). Fourth, it shows how emotional stability nonlinearly moderates the students' with low GPA agreement with the argument for intelligence (H4): The effect is less pronounced as emotional stability increases, with the slope reaching a plateau at average-to-average-high levels of emotional stability. Agreement with intelligence then decreases again at the highest levels of emotional stability, suggesting that average-to-average-high levels of emotional stability provide the strongest buffering effect against the threat of the argument.

To understand the mechanisms behind the relationships revealed by the quantitative analyses, we used content analysis (Weber, 1990) to analyze students' written reasons for either “using” or “not using” intelligence tests in hiring. Two of the authors independently reviewed and classified all of the rationales provided by students according to whether they reflected self-enhancing or self-protecting strategies (Hepper et al., 2010). The two authors were blind to students' GPAs while coding. In addition to these theoretically derived codes, the coders also generated inductive codes based on other recurrent themes in the data to capture potential alternative or complementary explanations. The overall Cohen's kappa² between the two coders was .88.

The vast majority of students (98%) provided comments regarding the use of intelligence testing in hiring. Further, those who gave self-enhancing comments never gave self-protective comments and vice versa. In Table 5 we present the codes derived from these comments, coding definitions, frequencies, and illustrative quotations for each code.

² The overall Cohen's κ is the weighted average of Cohen's κ for six codes in Table 5 by the number of answers in each code. Cohen's κ for each code was .98, .83, .88, .86, .79, and .82 in the order presented in Table 5. It was calculated by the following formula: $\kappa = \frac{\text{Pr}(\alpha) - \text{Pr}(e)}{1 - \text{Pr}(e)}$, $\text{Pr}(\alpha)$ = the relative observed agreement among raters, and $\text{Pr}(e)$ = the hypothetical probability of chance agreement (random agreement; Cohen, 1960).

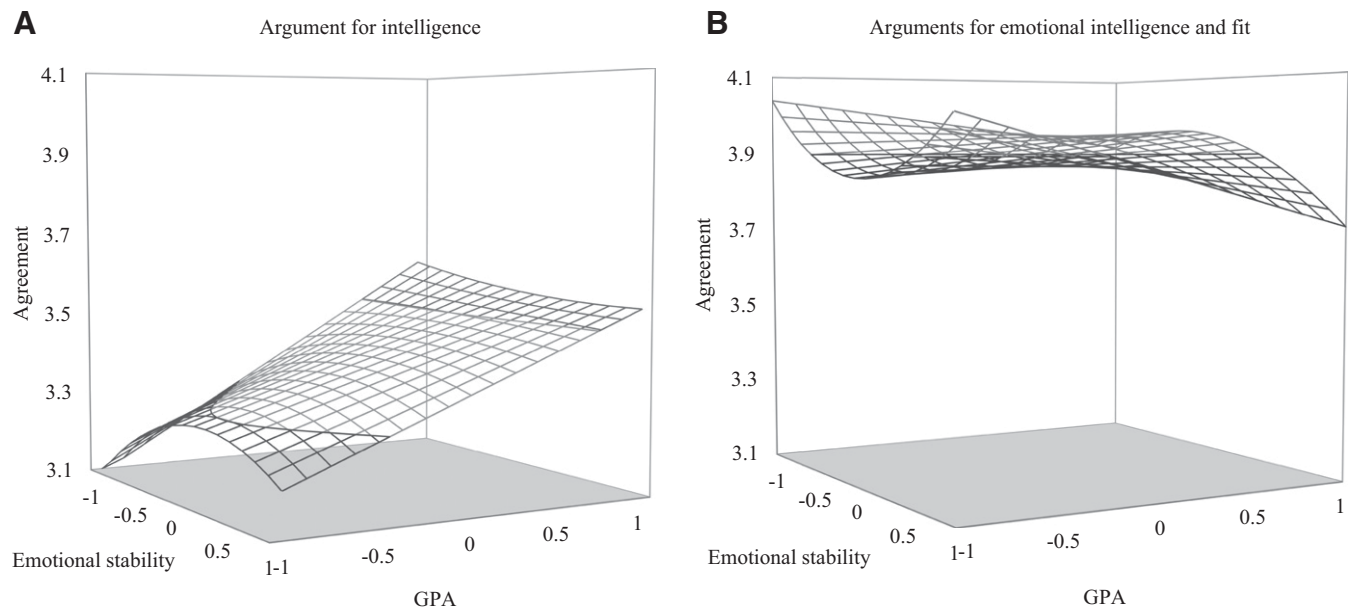


FIGURE 2

Effects of GPA and Emotional Intelligence on Agreement With the Research Arguments. (A) Argument for Intelligence, (B) Arguments for Emotional Intelligence and Fit

Self-enhancement, observed in 37.7% of cases, was considered to be present when students used the research argument to emphasize something important about their own attributes. For example, one self-enhancing student said, "Where I work, I had to take a test, which I scored well on, and I have been there for two years, and have made a lot of improvements in myself and in the company." In contrast, *self-protection* was considered to be present when students' rationales for their response to the argument included some type of denigration of the importance of intelligence based on their personal experience (19.9% of cases). For instance, a self-protecting student said, "I believe that people can be taught to do well at their job. For example, I don't have the highest GPA in the world but I am a very hard worker and strive to get my work done all the time at my job. I have actually been nominated for Student Employee of the Year because I am such a hard worker. It doesn't always depend on how smart you are or how intelligent you are as to if you do well on your job. You just have to have the initiative to take responsibility for getting your work done and wanting to do well in it." In total, self-motives (i.e., self-enhancement and self-protection) were detected in over half (57.6%) the responses, supporting the theoretical argument that students are likely to evaluate research

arguments in relation to their self-concepts (Alicke & Sedikides, 2011a).

In addition to these theoretically derived themes, open coding based on recurrent rationales revealed several other themes relevant to our investigation. First, very few students (only 7.2%) accepted the research argument solely by referring to the evidence presented (i.e., *unconditional evidence-based acceptance*). Second, a substantial number of students (39.9%) *conditionally accepted* the argument about the importance of intelligence. These students believed that intelligence is important, but (1) it must be considered along with other factors (*non-exclusive acceptance*, 22.2%); (2) it cannot be properly evaluated by tests (*no-testing acceptance*, 10.2%); or (3) it is important only for certain jobs (*job-specific acceptance*, 7.5%).

Moreover, these additional themes were *almost exclusively* found in the subset of students who showed no evidence of either self-protection or self-enhancement (i.e., 92% of the "non-exclusive," 100% of the "no-test," and 96.3% of the "job-specific" codes did not overlap with self-enhancement or self-protection codes). This finding suggests that, in general, students *either* evaluate research arguments pertinent to their academic self-concepts by employing self-enhancing or self-protecting strategies, or take a more "external" approach; that

TABLE 5
Qualitative Data Analysis (Codes, Definition of Codes, Frequency, and Examples)

Codes	Coding definition	Percentage	Examples
I. Theoretically derived codes			
<i>Self-enhancement</i>	Accept the predictive value of intelligence as consistent with personal experience/own attributes	37.7%	<p>"I think that they should test for intelligence because it really shows who are the best workers. Where I work, I had to take a test, which I scored well on, and I have been there for 2 years, and have made a lot of improvements in myself and in the company."</p> <p>"I feel that this was the most convincing argument of the previous two. Because I have found through my life that the 'more intelligent' people pick up on things quicker. It's the same idea as the more 'athletic' people do not have to work nearly as hard to be good at sports."</p>
<i>Self-protection</i>	Reject the predictive value of intelligence as inconsistent with personal experience/own attributes	19.9%	<p>"I believe that people can be taught to do well at their job. For example, I don't have the highest GPA in the world but I am a very hard worker and strive to get my work done all the time at my job. I have actually been nominated for Student Employee of the Year because I am such a hard worker. It doesn't always depend on how smart you are or how intelligent you are as to if you do well on your job. You just have to have the initiative to take responsibility for getting your work done and wanting to do well in it."</p> <p>"I believe that employers shouldn't be tested for intelligence because I feel that just because someone is intelligent doesn't make them a good worker or employee. I mostly base this opinion on personal experience. Both in high school and now in college, I know many people who are very intelligent but not hard workers at all."</p>
II. Data induced codes			
a. Conditional acceptance			
<i>"Non-exclusive" acceptance of research</i>	Accept the predictive value of intelligence but not exclusively (need to consider additional factors in hiring)	22.2%	<p>"I don't think intelligence alone should be the key factor whether or not someone gets hired. There are a lot of other qualities that come into play. These could be social skills and personality issues. Someone may be really smart and not be able to handle people. I do think intelligence is needed, but it is not the only thing to look at."</p> <p>"I think that while intelligence is very important to the ability of workers there are many more character traits that have just as large of an influence in the work place. For example, motivation and honesty are just as important characteristics for employees, intelligence in employees is not important to the company if the employees do not put effort into their work or are stealing from the company."</p>
<i>"No-testing" acceptance of research</i>	Accept the predictive value of intelligence but not accepting the use of tests	10.2%	<p>"I think that the point the article made about needing intelligence for any level of jobs is true, and thus employers should test for intelligence. However, there are many capable workers that would do a great job, but may not test well on intelligence tests because they are 'street smart' rather than 'book smart'. The main problem I see with intelligence testing is the fact that not all tests are fair, and some may be biased to certain groups."</p>

(table continues)

TABLE 5
Continued

Codes	Coding definition	Percentage	Examples
"Job-specific" acceptance of the research	Accept the predictive value of intelligence but only for certain jobs	7.5%	<p>"I agree with the author when he says that intelligence is a very important factor in choosing employees. However, I find it difficult to support actual intelligence testing of individuals. I think that in a well-conducted interview, the employer should be able to successfully determine if the individual possesses an adequate mental capacity to handle the job and learn new tasks efficiently."</p> <p>"It's important to have smart employees but the most intelligent people are not always the best candidates for a specific job. However, for some careers I do think that it would be beneficial to some employers to administer intelligence tests..."</p> <p>"I think it is greatly dependent on the type of position to what extent they need to have extremely high intelligence. For example, managers should not only be very intelligent but they should be able to deal with people very well—whereas a technical person such as a mechanic who deals little with people should have a high level of intelligence and moderate people skills. Intelligence is important, but it varies job to job."</p>
b. Unconditional acceptance "Evidence-based" acceptance of the argument	Accept the predictive value of intelligence because the research says so	7.2%	<p>"The author seems to have a valid argument on why intelligence plays a factor in the work place. He brings in the examples of different tests done to show how intelligence increases the workers' abilities."</p> <p>"This author used many resources to back up his main arguments. This essay was well written and properly conveys the message the author was intending to convey. I agree intelligence plays a strong role in success in the job field because intelligent people can adapt to more concrete and abstract ideas thrown their way."</p>

is, problematize the arguments by considering contingencies, feasibility, and so forth. We focus next on identifying whether and how these self-enhancing and self-protective processes were associated with the quantitative variables and relationships uncovered in the path model.

Linking Quantitative and Qualitative Findings

In Figure 3, we graphically display the means for three quantitatively measured variables (GPA, emotional stability, agreement with intelligence argument) for groups of students defined by the use (or non-use) of self-protection and self-enhancing strategies in their responses to the open-ended question. We use standardized means to reveal whether the groups depart from the average, and in which direction, on each variable.

As Figure 3 shows, the students who wrote self-protective rationales in their responses to the open-ended question were, on average, low on GPA and emotional stability, and unlikely to accept the intelligence argument ($M_{\text{the argument for intelligence}} = 2.77$). In contrast, the students who wrote self-enhancing rationales were high on GPA and emotional stability and showed high acceptance of the argument for intelligence ($M_{\text{the argument for intelligence}} = 3.75$). The third group ("others," i.e., employing neither self-protecting nor self-enhancing strategies) consisted of students who were high on GPA and emotional stability, but whose acceptance of the research argument was intermediate between the other two groups ($M_{\text{the argument for intelligence}} = 3.26$). In all instances the between-group mean differences are significant, as shown by the nonstandardized group means and ANOVA results reported in Table 6.

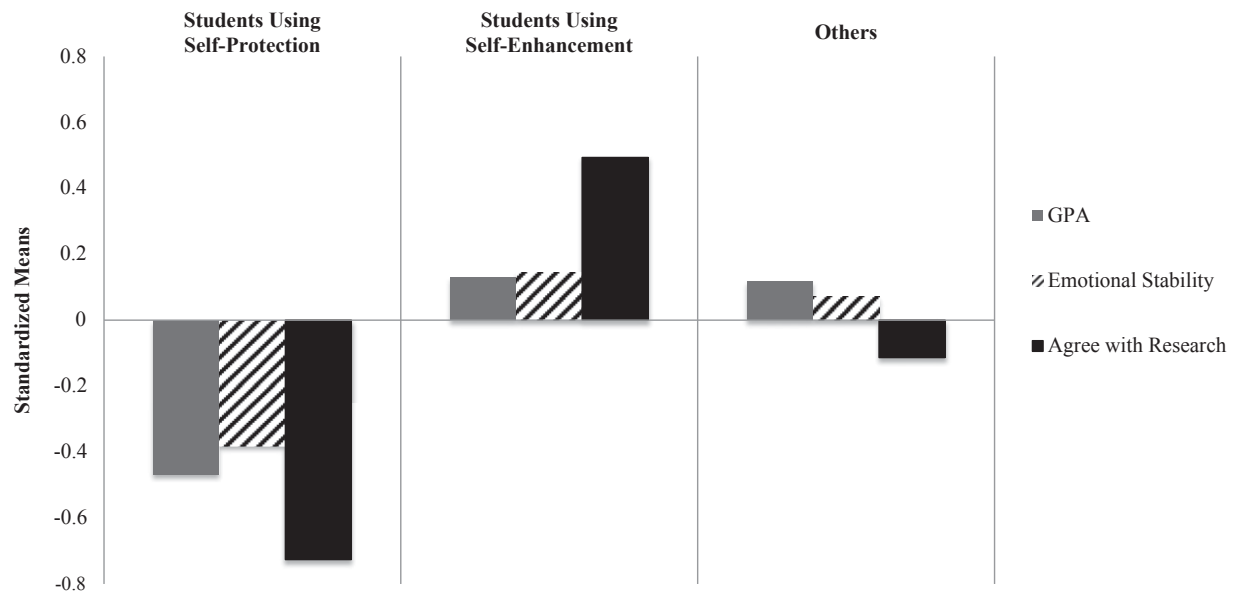


FIGURE 3

Graphical Representation of Standardized Means for GPA, Emotional Stability, and Agreement With Argument Across Groups of Students Who Showed Self-Protection/Self-Enhancement

Thus, consistent with theory (Alicke & Sedikides, 2011a), the hypothesized relationships were all supported (with one small modification). Further, processes of self-protection and self-enhancement were associated with students' reactions to the research-based arguments. We next discuss these findings and implications for teaching and research.

DISCUSSION

We began this article by introducing an important issue: That traditional approaches to management education seem to assume, at least implicitly, that scholarly arguments ought to be convincing merely by their academic nature. Consistent with rationalism, the acceptance of research evidence is

assumed, or at least advocated. For instance, Pfeffer and Sutton (2006) invite practitioners to "take a neutral, dispassionate approach to ideology and theories" so that they can pay attention to the hard evidence provided by science.

On its face, this advice is very reasonable. However, our study suggests that following it might be easier said than done. In the present case, reading research arguments about the importance of intelligence in hiring (compared to arguments about the importance of emotional intelligence and fit) evoked self-threatening responses to the extent that, on average, students were less likely to accept the argument about the importance of intelligence (H1). Further, the extent to which arguments presumably threatened or enhanced the students' academic

TABLE 6

Group Means and ANOVA Results for Differences Between Groups Defined by Use/Non-Use of Self-Protection and Self-Enhancement Strategies

Variable	Group Means			F value	p value
	Self-Protection (n = 72)	Self-Enhancement (n = 136)	Others (n = 153)		
GPA	2.80	3.11 ^a	3.11 ^a	9.15	.000
Emotional stability	3.75	4.26 ^b	4.19 ^b	7.22	.001
Agreement with the argument for intelligence	2.77	3.75	3.26	44.67	.000

Note: ^{a,b} pairs of group means that are not significantly different.

self-concepts (as suggested by their GPAs and confirmed later via qualitative analysis) affected how much they accepted the intelligence argument in comparison to the other arguments (H2 and H3). Emotional stability played a role in moderating these effects (H4), and the qualitative analysis further supported the proposed explanation that self-related mechanisms are at play.

Considerable scholarly evidence supports the importance of self-enhancement and self-protection in explaining a variety of self-serving biases (Alicke & Sedikides, 2011b). What has not previously been explored, however, is how self-enhancement and self-protection processes may alter students' responses to certain research arguments, which may then have an impact on whether findings are accepted or rejected. Although other authors have made similar theoretical arguments and provided examples of students disengaging from learning (Vince, 2010; Lund Dean & Jolly, 2012) or deconstructing academic texts (Trank, 2014), we focused on empirically capturing these processes. In doing so, we hope to encourage more research aimed at clarifying the role self-related processes may play in students' reactions to research-based claims.

How students (and the public in general) react to research claims is certainly an important topic. There has been an overall increase in skepticism (at least in the U.S.) about scientific findings in general—a skepticism that has been deliberately fostered to advance particular political and corporate interests (Hansen, 2010; Mooney, 2006; Oreskes & Conway, 2011). Such skepticism may be explained by many reasons, not just the one we present here. In our case, for instance, beyond the particular rejection of the argument for intelligence for students with lower GPAs, there is limited acceptance across all essays. Thus, despite whether students' reactions to research are self-referential, instructors should not expect a "free pass" from being challenged just because they have presented research claims based on empirical evidence.

Implications for Teaching

Our findings have a number of implications for instructors, especially with regard to evidence-based teaching. In particular, once it is recognized that students are unlikely to automatically accept all proffered research findings, instructors may need to reframe how they think about such teaching (cf. Rynes, Rousseau, & Barends, 2014). As Erez and Grant (2014) note, some instructors introduce

evidence in a way that shows students how wrong their prior beliefs are. This approach may be very effective for some topics; however, as we have demonstrated, for arguments that can be associated with aspects of the self-concept, it may not be successful. Directly challenging beliefs that can be "personal" to students may trigger self-protective processes and motivate information processing that may be counterproductive to learning.

Instead, our findings suggest several implications for instructors that echo components of the Adaptive Learning System (ALS) framework for training (Bell & Kozlowski, 2008, 2009; Kozlowski et al., 2001). As Bell and Kozlowski (2008) note, training or instruction based on this framework aims to provide trainees or students with considerable control over and responsibility for their own learning (and would thus help counteract concerns about agency; cf. Giluk & Rynes, 2012). Unlike many approaches to learning, the ALS framework consciously recognizes and works with self-evaluative, affective processes as important elements in learners' self-regulation systems (Kozlowski et al., 2001). Specifically, Bell and Kozlowski (2009) suggested three core elements for active learning: the nature of instruction, motivational induction, and emotion control. We propose implications of our study for stimulating students' self-regulatory processes related to each of these elements of active learning.

First, it is prudent to carefully assess the potential threat to the self that may be associated with particular research findings, and when such threat is expected, to consider alternative approaches to presenting the findings in ways that stimulate students' cognitive self-regulatory processes. For example, rather than simply presenting research findings, instructors can reveal more about how they were produced and interpreted, and then invite students to discuss them critically: Good examples of this approach are presented in Dietz et al. (2014) and Trank (2014). By not making excessive truth claims (Ghoshal, 2005; von Hayek, 1989), but inviting students to think critically about the findings, instructors may lessen students' perceived need to react against them.

Consistent with this approach, an interesting finding in our data is the fact that those students who did not present self-protecting and self-enhancing arguments engaged in a more nuanced analysis of the research claims (i.e., conditional acceptance of the argument for intelligence). In other words, these students developed their own ideas and interpretations

of the evidence, rather than simply accepting or rejecting it. Instructors may be able to trigger such processing by encouraging student exploration (Bell & Kozlowski, 2009), which also increases students' responsibility for their own learning (Dietz et al., 2014) and their sense of being in control.

Acknowledging limitations of research and acknowledging that future research may revise a particular finding may also help students' exploratory learning. Indeed, the transitory nature of research evidence is quite relevant to the present study. Specifically, although arguments about the importance of intelligence at work have received substantial support over time (e.g., Ree et al., 1994; Schmidt, 2002), new findings about intelligence and related constructs continue to emerge (Nisbett et al., 2012). For example, Côté & Miners (2006) found that emotional intelligence can have a compensatory effect in relation to cognitive intelligence for important outcomes such as task performance and organizational citizenship behavior. In addition, emotional intelligence has been found to have incremental predictive validity for job performance above both cognitive ability and personality (O'Boyle et al., 2011). Thus, recent evidence is consistent with the views of the students who accepted the importance of intelligence, but not exclusively or unconditionally. Instructors might benefit from paying attention to students' observations and rationales as thought provoking and worthy of further inquiry.

Second, instructors may direct students' motivation from validating themselves to improving or developing themselves. Bell and Kozlowski (2009) argued that setting a goal for developing new skills and knowledge leads to more adaptive and active learning than a performance goal for attaining (avoiding) a favorable (unfavorable) judgment of existing competence. Effective and appropriate in-class feedback that focuses less on students' self-related concepts and more on their progress on particular tasks or knowledge acquisition (Kluger & DeNisi, 1996) may also be helpful in enhancing learning and reducing threat.

Third, instructors may help students regulate their emotions (Bell & Kozlowski, 2009) by creating a safe and caring classroom environment. In discussing how to teach ethics (where students often enter the classroom with very strong values and beliefs that have been inculcated at an early age), Giacalone and Promislo (2013: 95) argue that "it is important for faculty to model caring for students...to exemplify *interactional justice*, a way of behaving that conveys

respect, sensitivity, compassion, and dignity." Role modeling and creating a safe environment foster critical thinking about topics with strong emotional content because they provide students with legitimate ways to express concerns about research that may be self-threatening, while at the same time increasing the likelihood that students will feel heard and understood (Rynes & Trank, 1999). Additional benefits may be achieved by creating not only a safe environment, but also be a fun one (e.g., Charlier, 2014; Erez & Grant, 2014).

Last but not least, although this study is about the acceptance or rejection of research by students, the findings prompt the need for instructors (and researchers or academics in general) to reflect on the extent to which the research they present in class (or pursue) may be influenced by self-related processes. At times, we too may prefer certain findings over others based on how we, personally, relate to such evidence. This may have implications on what evidence we choose to emphasize in class (or in our research), how we present it, and how we respond to students' critical reactions to particular evidence.

Limitations and Future Research

There are some limitations to our research associated with our measurement. One is that we did not directly measure threat, but instead relied on logic and existing evidence in making the assumption that the argument for intelligence would be more threatening than the alternative arguments for emotional intelligence and fit. We did this because asking students directly about how threatening they find the content of these essays would have likely triggered impression management tendencies. Thus, we chose a more subtle way of exploring self-related processes, although we acknowledge that alternative ways of exploring the full range of internal processes that may be involved are needed. Similarly, more direct tests of the role played by emotional stability are required to further explore the counterintuitive quadratic effect we found.

A second limitation is that we did not directly measure students' implicit theories about intelligence. As Dweck (2008) points out, there are individual differences in the extent to which people believe intelligence is fixed—although 40% believe that it is, another 40% believe that it is not (the other 20% are uncertain). Based on Dweck's research, it is possible that the students in our sample with

the highest GPAs achieved those higher grades because of their belief that intelligence (and grades) can be enhanced with hard work. Future research incorporating implicit theories will help illuminate the processes underlying our present findings. For example, perhaps those students who evaluated the intelligence essay strictly in terms of the argument itself (with no evidence of self-enhancement or self-protection) were those who had the strongest beliefs in the malleability of intelligence and grades, thus feeling little need for defensive responding because of their greater sense of agency.

There are also some limitations associated with the stimulus essays. First, whereas the essay on intelligence focuses mainly on what might be called "core job performance" (Campbell, McHenry, & Wise, 1990), the other essays emphasize additional aspects of performance, such as initiative, empathy, adaptability, and persuasiveness (the emotional intelligence essay) and willingness to provide good service, interpersonal skills, and reduced likelihood of turnover (the fit essay). Although these differences in emphasis with respect to what was included in "performance" are accurate reflections of the original authors' persuasive arguments, future studies may explore the extent to which acceptance varies when one or more of these different aspects of performance are included in the argument.

Second, the essays on emotional intelligence and fit contained personal anecdotes, whereas the essay on intelligence did not. This difference may have made the essays on fit and emotional intelligence relatively more convincing to students, as studies of medical and jury decision making have shown that anecdotes are often more persuasive than large-sample statistical findings (e.g., Ayres, 2008; Givelber & Strickler, 2006; Krauss & Sales, 2001; Rynes, 2012). Regardless of this difference, there is ample cross-cultural evidence that people generally do not like the idea that intelligence is an important predictor of success (Pinker, 2002; Rynes et al., 2002; Sanders, van Riemsdijk, & Groen, 2008; Tenhiälä, Giluk, Kepes, Simón, Oh, & Kim, 2016). As such we believe our findings would likely hold even if the argument for intelligence included anecdotes or if the arguments for emotional intelligence and fit did not.

Third, as noted earlier, the stimuli did not include any statistical evidence. We did not include statistical information for three reasons: First, Pfeffer's original essay on fit did not include any statistics, whereas the other two did. To include statistics in the essays on intelligence and emotional

intelligence but not in the essay on fit would have introduced a potential confounding variable. Second, the specific statistics offered by Goleman (percent variance explained in job performance by intelligence) were different from the ones offered by Schmidt (corrected validity coefficients), making them not directly comparable. Third, many of the students had not yet taken a statistics course. As such, including statistics would have been akin to giving students essays that were above their "grade level." Still, the role played by statistical evidence in the acceptance of research is an important avenue for future studies, particularly as we move toward an era of increased "evidence-based" claiming (Trank, 2014) and use of "big data" methods that few people are likely to understand (Ayres, 2008).

Last, at a more general level, the language, key terms, and the writing style used in the essays may also influence how persuasive these texts are. We did not manipulate or control for this influence, as our focus was on presenting the essays as close as possible to the original: We selected the paragraphs that we thought were core to the argument made by each author. Yet it would be interesting to explore to what extent changing the language or style used to present a particular argument could mitigate or accentuate the threat associated with it, and consequently, its acceptance.

Future research should explore student reactions to other research arguments. Although the criteria for hiring decisions is a particularly apt topic for examining the possibility of self-protective and self-enhancing responses, future research should also investigate to what extent self-enhancement and self-protection mechanisms are present in students' responses to other research domains. For instance, individuals with high need for power may protect themselves against research arguments showing that egalitarian leaders are more effective (see, e.g., Tetlock, 2000), introverts may not agree with research suggesting the advantages of extraverts, and xenophobic students may not accept arguments that suggest the benefits of cultural diversity (e.g., Fong & Markus, 1982; Rydgren, 2004). On the other hand, individuals with low need for power, extraverts, and culturally diverse people may find those same arguments self-enhancing, and thus, overemphasize their importance. Exploring additional potentially self-relevant research arguments such as these will help extend our theoretical and practical implications, improve the generalizability of our insights, further

elaborate the mechanisms involved in the acceptance and rejection of research arguments, and perhaps enhance our capacity to educate.

The study revealed a range of responses that call for further exploration. Theorists who write about self-protection and self-enhancement tend to do so from the perspective that these responses are largely universal, even if they are manifested in different ways (Alicke & Sedikides, 2011a). In our case, however, when students were able to describe their rationales for accepting or rejecting research arguments, some did not employ either of these strategies, but rather considered the arguments in light of how they might be linked with other information. As such, our findings suggest that there are some people who have the capacity to engage with arguments in a way that does not focus on their own self-concept, or at least in a way that maintains a more "critical" stance. Replicating this finding in other contexts and uncovering what differentiates such thinkers from those who self-enhance or self-protect would be a worthwhile future research venture.

Last, given potential cultural variations in the way self-enhancement and self-protection are manifested (e.g., Chiu, Wan, Cheng, Kim, & Yang, 2011) and the fact that in many universities nowadays the student population is culturally diverse, it will be important to replicate a study like ours in different cultural contexts or with consideration for the cultural background of students.

CONCLUSION

Our results illustrate one content area in which students' acceptance of research evidence seems to be influenced by self-related processes. We strongly suspect that other sensitive content areas are likely to produce similar effects, and we encourage other researchers to explore student reactions to them using a variety of methodologies. In addition, we encourage instructors to consciously maintain awareness of the potential threat to students' self, which is associated with certain research arguments, and to implement some of our (and others') suggestions for creating safe learning environments. Of course, even when such steps are taken, it seems prudent to remain prepared for dealing with potential student skepticism toward research-based arguments and empirical evidence. Paying attention to students' underlying concerns may further improve our capacity to develop and communicate scholarly

findings, contributing to the ultimate goal of evidence-based teaching and management.

APPENDIX 1

Essay Presenting the Argument for Intelligence

Select for Intelligence

Other things equal, higher intelligence leads to better job performance on all jobs. Intelligence is the major determinant of job performance, and therefore hiring people based on intelligence leads to marked improvements in job performance—improvements that have economic value to the firm.

This principle is very broad: it applies to all types of jobs at all job levels. Until a couple of decades ago, most people believed that general principles of this sort were impossible in personnel selection and other social science areas. It was believed that each organization, work setting, and job was unique and that it was not possible to know which selection methods would work on any job without conducting a study on that job in that organization. This belief was based on the fact that different validity studies in different organizations appeared to give different results. However, we now know that these "conflicting findings" were mostly due to statistical and measurement artifacts and that some selection procedures have high validity for predicting performance on all jobs (e.g., intelligence) and others do a poor job of predicting performance on *any* job (e.g., handwriting analysis). This discovery was made possible by new methods, called meta-analysis, that allow researchers to statistically combine results across many studies.

What is intelligence? Intelligence is the ability to grasp and reason correctly with abstractions (concepts) and solve problems. However, perhaps a more useful definition is that intelligence is the ability to learn. Higher intelligence leads to more rapid learning, and the more complex the material to be learned, the more this is true. Intelligence is often referred to as general mental and general cognitive ability, and we use all these terms interchangeably.

Intelligence is the broadest of all human abilities. It predicts many important life outcomes in addition to job performance: performance in school, amount of education obtained, promotion on the job, ultimate job level attained, income, and many other things. It is even involved in everyday activities such as shopping, driving, and paying bills. No other trait—not even conscientiousness—predicts so many important real-world outcomes so well. In this sense, intelligence is the most important trait or construct in all of psychology.

The thousands of studies showing the link between intelligence and job performance have been combined into many different meta-analyses. Ree and co-workers have shown this for military jobs. Hunter and Hunter (1984) have shown it for a wide variety of civilian jobs, using the US Employment Service database of studies. Schmidt, Hunter, and Pearlman (1980) have shown it for both civilian and military jobs. Other large meta-analytic studies are described in Hunter and Schmidt (1996). The amount of empirical evidence supporting this principle is today so massive that it is hard to find anyone who questions the principle.

It is one thing to have overwhelming empirical evidence showing a principle is true and quite another to explain *why* the

principle is true. *Why* does intelligence predict job performance? The primary reason is that people who are more intelligent learn more job knowledge and learn it faster. The major direct determinant of job performance is not intelligence but job knowledge. People who do not know how to do a job cannot perform that job well. Research has shown that considerable job knowledge is required to perform even jobs most college students would think of as “simple jobs,” such as truck driver or machine operator. More complex jobs require even more job knowledge. The simplest model of job performance is this: intelligence causes job knowledge, which in turn causes job performance. But this model is a little too simple: there is also a causal path directly from intelligence to job performance, independent of job knowledge. That is, even when workers have equal job knowledge, the more intelligent workers have higher job performance. This is because there are problems that come up on the job that are not covered by previous job knowledge, and intelligence is used directly on the job to solve these problems.

APPENDIX 2

Essay Presenting the Argument for Emotional Intelligence

Select for Emotional Intelligence

The rules for work are changing. We’re being judged by a new yardstick: not just by how smart we are, or by our training and expertise, but also by how well we handle ourselves and each other. This yardstick is increasingly applied in choosing who will be hired and who will not, who will be let go and who retained, who passed over and who promoted. The new rules predict who is most likely to become a star performer and who is most prone to derailing. And, no matter what field we work in currently, they measure the traits that are crucial to our marketability for future jobs.

These rules have little to do with what we were told was important in school; academic abilities are largely irrelevant to this standard. The new measure takes for granted having enough intellectual ability and technical know-how to do our jobs; it focuses instead on personal qualities, such as initiative and empathy, adaptability and persuasiveness.

This is no passing fad, nor just the management nostrum of the moment. The data that argue for taking it seriously are based on studies of tens of thousands of working people, in callings of every kind. The research distills with unprecedented precision which qualities mark a star performer. And it demonstrates which human abilities make up the greater part of the ingredients for excellence at work—most especially for leadership.

In a time with no guarantees of job security, when the very concept of a “job” is rapidly being replaced by “portable skills,” these are prime qualities that make and keep us employable. Talked about loosely for decades under a variety of names, from “character” and “personality” to “soft skills” and “competence,” there is at last a more precise understanding of these human talents, and a new name for them: emotional intelligence.

“I had the lowest cumulative grade point average ever in my engineering school,” the co-director of a consulting firm tells me.

“But when I joined the Army and went to officer candidate school, I was number one in my class—it was all about how you handle yourself, get along with people, work in teams, leadership. And that’s what I find to be true in the world of work.”

Over and over I heard what became a familiar litany. People like the high-performing business consultant with the low GPA told me they found emotional intelligence, not technical expertise or book learning, to be what mattered most for excellence.

Two of the smartest people I ever knew (at least in the academic sense) followed strikingly different career paths. One was a friend during my freshman year in college who had perfect scores on his college admissions tests—a pair of 800s on the verbal and math sections of the SAT, and a 5 on each of three advanced placement tests. But he was unmotivated in school, often skipped class, and got papers in late. He dropped out for a while, finally graduating after ten years. Today he reports he is satisfied working as a one-man computer consulting business.

The other was a math prodigy who entered by high school at ten, graduated at twelve, and got his doctorate in theoretical mathematics from Oxford at eighteen. In high school he was a bit short for his age, which, because he was so young, made him about a foot shorter than most of us. He was also about twice as bright as everyone else—and many students resented him for it. He was often taunted and bullied. But despite his diminutive stature, he didn’t back down. Like a little bantam rooster, he stood his ground against the biggest hulks in school. He had assertiveness to match his intellect—which may explain why, last I heard, he’s now the head of one of the most prestigious mathematics departments in the world.

APPENDIX 3

Essay Presenting the Argument for Fit

Select for Fit

The skills and abilities hired need to be carefully considered and consistent with the particular job requirements and the organization’s approach to its market. Simply hiring the “best and the brightest” may not make sense in all circumstances. Enterprise Rent-A-Car is today the largest car rental company in the United States, with revenue in 1996 of \$3 billion, and it has expanded at a rate of between 25 and 30 percent a year for the past eleven years. It has grown by pursuing a high customer service strategy and emphasizing sales of rental car services to repair garage customers. In a low wage, often unionized, and seemingly low employee skill industry, virtually all of Enterprise’s people are college graduates. But these people are hired primarily for their sales skills and personality and for their willingness to provide good service, not for their academic performance. Dennis Ross, the chief operating officer commented “we hire from the half of the college class that makes the upper half possible... We want athletes, fraternity types... ‘people people.’” Brien O’Reilly interpolates Enterprise’s reasoning:

The social directors make good sales people, able to chat up service managers and calm down someone who has just been in a car wreck... The Enterprise employees hired from the caboose end of the class have something else going for them... a chilling realization of how unforgiving the job market can be.

It is tempting to hire on the basis of ability or intelligence rather than fit with the organization—so tempting that one occasionally observes firms trying to differentiate among a set of individuals who are basically similar in intelligence or ability while failing to try to distinguish those that will be well suited to the organization from those that will not. One of my favorite examples of this is recruitment at Stanford Business School. Stanford has a class of about 370 MBAs, selected from an initial applicant pool that in recent years has exceeded six thousand. These are obviously talented, motivated, and very intelligent individuals. Distinguishing among them on those criteria would be difficult, if not impossible. But many firms seek to do the impossible—they try to get around the school's policy of not releasing grades in an effort to figure out who are the smartest students and to assess differences in ability among a set of applicants through interviewing techniques such as giving them problems or cases to solve. Meanwhile, although many job recruits will leave their first job within the first two years, and such turnover and the requirement to refill those positions are exceedingly expensive, few firms focus primarily on determining fit—something that does vary dramatically.

Two firms that take a more sensible and pragmatic approach to hiring are Hewlett-Packard and PeopleSoft, a producer of human resource management software. For instance, one MBA job applicant reported that in interviews with PeopleSoft, the company asked very little about personal or academic background, except about learning experiences from school and work. Rather, the interviews focused mostly on whether the person saw herself as team oriented or as an individual achiever; what she liked to do outside school and work; and her philosophy on life. The specific question was "Do you have a personal mission statement? If you don't, what would it be if you were to write it today?" Moreover, the people interviewing the applicant presented a consistent picture of PeopleSoft as a company and of the values that were shared among employees. Such a selection process is more likely to produce cultural fit. A great deal of research evidence shows that the degree of cultural fit and value congruence between job applicants and their organizations significantly predicts both subsequent turnover and job performance.

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