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ON GETTING BETTER AND WORKING HARD: USING IMPROVEMENT AS A HEURISTIC FOR JUDGING EFFORT

Monica El Gamal
elxg0950@mylaurier.ca

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ON GETTING BETTER AND WORKING HARD: USING IMPROVEMENT AS A
HEURISTIC FOR JUDGING EFFORT

by

Monica El Gamal

Bachelor of Arts, Psychology, Wilfrid Laurier University, 2008

Master of Science, Marketing and Consumer Studies, University of Guelph, 2010

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Abstract

There is a strong conceptual association between improvement and effort. Therefore, we propose that people tend to use improvement as a heuristic for judging effort in others. Hence, they would perceive greater effort in improved performance records than in non-improved records with superior overall performance. To examine whether people use improvement as a heuristic for effort, we compared judgments of effort investments and trait effort in improved and consistently-strong performance profiles with equivalent recent performance. Across six empirical studies, participants thought that those with improved profiles exerted more effort and were more hardworking than those with consistently-strong profiles, and this resulted in a preference for improved candidates when making decisions (e.g., selecting among candidates for a promotion). Even when we introduced manipulations that highlighted strengths of the consistent profiles, participants still made effort judgements in favour of improvement (Studies 2 and 3). Moreover, participants had a greater tendency to mention effort as a reason for selecting an improved (vs. consistently-strong) candidate for an award (Study 4). Furthermore, two studies (Studies 5 and 6) showed that the use of improvement as a heuristic for effort was restricted to contexts with considerable ambiguity. Finally, we examined the overall effects using meta-analyses (Study 7). Overall, the results provided converging evidence that people use improvement as a heuristic for judging effort, particularly in contexts that are relatively ambiguous, and that these judgments can have implications for important decisions.

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Lastly, I would like to dedicate this dissertation to my grandfather Dr. Shawky El Gamal. The memory of his hard work and dedication continues to inspire me to work harder and to get better.

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"It is only through labor and painful effort, by grim energy and resolute courage, that we move on to better things." - Theodore Roosevelt

As this saying suggests, people tend to see a strong association between improvement and effort. This association stems from the belief that if an individual works hard, his/her performance will get better. Because of the strength of this association, we propose that people intuitively perceive improvement to be a cue signaling an underlying exertion of effort. The use of improvement as an indicator of effort may be an appealing heuristic (i.e., mental shortcut) in many important decision contexts. For example, in graduate school admissions or workplace decisions, decision makers need to form judgments about others based on performance records in which patterns of performance are often salient in the absence of direct information about effort. Therefore, in these contexts, patterns of performance can influence effort judgments, which can in turn influence the decisions made (e.g., whom to hire or whom to accept into an academic program). It is important to examine judgments of effort and how they can be influenced by patterns of performance (e.g., improvement) because of the important role these judgments can play in such consequential decisions. The present research is the first to explore the potential use of improvement as a heuristic for effort and its impact on decision-making in various employment settings and in the academic context.

Heuristic Judgments

People employ heuristics – or mental shortcuts- frequently and ubiquitously. In many cases, the use of heuristics reflects intuitive processes that are elicited by features of the judgment task (Gilovich, Griffin, & Kahneman, 2002). These types of heuristics have been referred to as "judgmental heuristics" (Kahneman & Frederick, 2002, p. 20).

Dual process models of cognition provide a framework for understanding when and why judgmental heuristics guide overt judgments. For example, according to the two systems model of reasoning, there are two distinct approaches to judgment: one is intuitive, fast, and effortless (System 1); whereas the other is more deliberative, slow, and effortful (System 2). The two systems may operate simultaneously and can sometimes compete for directing overt judgments (Kahneman & Frederick, 2002). Judgmental heuristics are largely the result of System 1 reasoning; they stem from intuitive associations. When facing a difficult question, people may end up answering a simpler related question based on intuitions that come to mind effortlessly. In other words, instead of making the more challenging judgment of the "target attribute", people make a judgment regarding a related "heuristic attribute"; this process has been referred to as "attribute substitution" (Kahneman & Frederick, 2002, p. 53). For instance, when asked to judge the frequency of words starting with the letter "r" versus the letter "k" in the English language, people may instead assess the availability of exemplars for each. This is a classic demonstration of the use of the "availability heuristic", whereby the heuristic attribute, availability of exemplars, replaces the target attribute in question. According to Kahneman and Frederick, judgmental heuristics direct judgments when particular conditions are met: First, the accessibility of the target attribute needs to be lower than that of the related heuristic attribute. Second, System 2 operations should not reject or override the heuristic judgment. More generally, judgmental heuristics tend to guide judgments in contexts that have a considerable level of ambiguity or uncertainty.

It is noteworthy that in the example of attribute substitution outlined above, the availability of exemplars tends to be associated with frequency to some extent. Therefore,

the attribute substitution process can provide an efficient mental shortcut, leading to valid judgments in many cases. Nevertheless, because the heuristic attribute is not perfectly correlated with the target attribute (e.g., availability of exemplars is not a perfect indicator of frequency), there are cases where attribute substitution leads to systematic biases in judgment. Indeed, there is a huge body of research demonstrating how the use of heuristics may sometimes lead people to overlook important diagnostic aspects of a situation and to engage in systematic biases in judgment (Chaiken, Liberman, & Eagly, 1989; Gilovich et al., 2002; Kruger, Wirtz, Van Boven, & Altermatt, 2004; Tversky & Kahneman, 1974).

In the present research, we explore the use of improvement as a heuristic for judging effort. As mentioned earlier, we believe that there is a strong conceptual association between improvement and effort, at least in Western cultures where the present set of studies was conducted. Moreover, information about effort investments in others is typically harder to access than performance records, which are often tracked and made accessible for evaluation purposes. Therefore, when people are being asked to judge the amount of effort invested by another person, they could rely on salient trends in performance records (e.g., improvement or consistency) as an indicator of effort. In these contexts, improvement can be used as a substitute for the target attribute, which is effort. It is important to note that in some cases, improvement can be a valid cue for making judgments about effort. For example, think of two employees starting a new job at an identical low performance level. Following the initial low performance, one employee improved steadily to reach a much higher performance level, whereas the other consistently performed at a low level. In this case, it would be reasonable to think that the

improved employee invested greater effort than the consistent employee, assuming other variables are held constant. However, as with other heuristics, we propose that the reliance on improvement to judge effort may sometimes lead people to overlook other important diagnostic aspects of a situation and to make erroneous judgments. For example, would people perceive greater effort in improved performance records than in non-improved records with superior overall performance? We propose that this can occur when evaluating an improved record and a consistently strong record, and that these effort perceptions can influence preferences when making consequential decisions involving these two types of performance records.

Preferences for Improvement and Consistency

Imagine being on a committee that evaluates a number of employee profiles with the goal of selecting one employee for promotion. You come across two profiles with equally strong recent performance but different patterns leading to that strong performance: one employee has been consistently performing at a strong level, whereas the other started much lower and improved steadily to reach that level. Who do you think has invested more effort? Which employee would you view as more hardworking and persistent in their effort? Consequently, as a committee member evaluating the two employees, who would you recommend for the promotion? To examine the use of improvement as a heuristic, the present research focuses on how evaluators perceive the effort invested by consistent and improved performance profiles with identical final performance, and how these judgments ultimately influence decisions involving these two types of profiles.

Importantly, there are a number of evident strengths displayed in the consistent profile in the above scenario. Given that recent performance is equivalent in the improved and the consistent profiles, this implies that at every point in time, the consistent employee's performance was either equivalent or superior to that of the improved employee. Hence, the consistent employee had a stronger overall performance (average performance). One might think that strong performance could indicate that the employee has been putting great effort in his/her work day after day and that this, in turn, could lead him/her to be evaluated more favourably. The consistent pattern may also attest to the reliability and dependability of this individual. Together, these reasons could drive a preference for consistency over improvement in performance; particularly in this example where recent performance is equivalent. Despite these strengths, we expect that people would rely on improvement as a heuristic for effort. This could lead them to overlook strengths of the consistent profile and to judge his/her effort less favourably.

To our knowledge, this proposition has not been addressed in previous research. However, broadly speaking, the present studies can be situated in a body of work in psychology that has examined general preferences for consistency and improvement. Much of this research has focused on evaluations of the self – as opposed to evaluating these trends in others. Considerable research shows that people sometimes prefer consistency over change (Cialdini, Trost, & Newsom, 1995; Festinger, 1957; Heider, 1958; Zajonc, 1960). For example, classic lines of work on cognitive balance theory (Heider, 1958), cognitive dissonance (Festinger, 1957), and the foot-in-the-door effect (Freedman & Fraser, 1966) emphasize people's motivation to perceive consistency in their attitudes and behaviours. The preference for consistency has also been

conceptualized as an individual difference (Cialdini et al., 1995). The scale developed to assess this variable includes items that measure the degree to which people prefer to see consistency in the self and others (Cialdini et al., 1995). Notably, however, research that employed this scale still focused on the scale's utility in predicting a preference for consistency within one's own attitudes and behaviours (e.g., Bator & Cialdini, 2006; Guadango, Asher, Demaine, & Cialdini, 2001; Newby-Clark, McGregor, & Zanna, 2002).

There is also a sizable body of research showing that people sometimes display a general preference for improvement over other intertemporal trends. For example, there is a wealth of evidence suggesting that people are motivated to see improvement in the self (e.g., McAdams, Reynolds, Lewis, Patten, & Bowman, 2001; McFarland & Buehler, 2012; Wilson & Ross, 2001; Zell & Alicke, 2010). Less is known about perceptions and evaluations of improvement and consistency in others, which is examined in the current research.

Recent studies started exploring the question of when and why people may prefer improvement over other alternative performance patterns in others (El Gamal & Buehler, 2014; Pettit, Sivanathan, Gladstone, & Marr, 2013; Zell & Alicke, 2010). For example, Pettit et al. (2013) examined how people judge the current status of others based on changes in their status rankings across time. Improvement in rankings was viewed more favourably than either consistency or decline: Of particular note, targets that ascended in rank were perceived as having higher status than those that maintained the same rank over time, even though the final ranking was identical. Zell and Alicke (2010) examined evaluations of improvement, decline, and consistency in percentile rankings of others,

with the average percentile ranking being held constant. Similar to Pettit et al. (2013), they found that people who improved in percentile ranking were evaluated more favourably than those who held the same ranking over time or declined in ranking. These findings suggest that improvement may be viewed more favourably than consistency in others. However, the studies focus on judgements of improved and consistent status rankings, which may differ from judgements of absolute performance patterns. For instance, one's absolute performance may improve but their status ranking could stay the same if the other individuals being ranked are all improving at a similar rate. To address this limitation, El Gamal and Buehler (2014) examined comparisons of an improved and a consistent performance profile, with the final performance level being constant (e.g., a student improving from a B-average to an A-average vs. one who received straight A's). The two profiles were presented side-by-side to allow participants to simultaneously evaluate them. This study found that participants preferred profiles displaying improved performance over consistent high performance in decision contexts that place a greater emphasis on future potential than on actual achievement. In contrast, when the decision context emphasized past achievement, participants preferred consistent high performance over improved performance.

Taken together, the reviewed literature suggests that improvement and consistency can each be appealing in certain contexts. Of particular relevance to the current research, recent studies (Pettit et al., 2013; El Gamal & Buehler, 2014; Zell & Alicke, 2010) examined the preferences of improvement versus consistency in others. These studies focused on the role of performance or status evaluations and future expectations pertaining to these types of evaluations in driving preferences. In the present

research, we further examine preferences for improvement versus consistent strong

performance in others, and we focus on the role of effort perceptions in driving decision

preferences. To date, researchers have not yet examined whether effort perceptions can

be one factor underlying preferences for improvement over alternate intertemporal

patterns; and we think that these perceptions would play an important role.

Effort Perceptions

Social psychologists have long been interested in perceptions of effort. According

to a classic body of literature on attributions (Heider, 1958; Jones, 1989; Weiner,

Heckhausen, Meyer, & Cook, 1972), effort is one of four types of causes that people

commonly use to explain outcomes of their own and others' behaviours. For example,

success can be thought of as a result of great effort investments, whereas failure can be

seen as the result of a lack of effort. The other three types of causal attributions in the

literature are ability, luck, and task difficulty. These attributions differ in terms of two

dimensions: locus of control (i.e., whether they are controlled internally by the individual

versus by other factors that are external to the individual) and variability (whether they

are perceived to be variable or fixed). Both ability and effort tend to be conceptualized as

internal attributions, for which the locus of control is within the individual. Generally,

ability has been classified as a fixed attribution, whereas effort has been conceptualized

as a modifiable variable that can change with time. However, some attribution

researchers (e.g., Jones, 1989; Weiner et al., 1972) acknowledge that effort can

sometimes be thought of as a stable trait. For example, an individual can be described as

being lazy or hard working. Therefore, Weiner and colleagues (1972) argue that effort is

a unique attribution in that it includes both stable and variable elements, and that this

unique feature makes it particularly important for understanding attributions of achievement.

One line of attribution research that is particularly relevant to the present studies examines the role of temporal trajectories in attributional judgments (Butler, 2000; Jones, Rock, Shaver, Goethals, & Ward, 1968; Jones & Welsh, 1971). The main focus of this research was on attributions of ability and how they can be influenced by temporal patterns, such as improvement or decline. For example, Jones and colleagues (1968) presented participants with a random, ascending, or descending pattern of success, which was ostensibly achieved by another participant in a problem-solving task, and measured attributions of intellectual ability and future performance expectations for the 'participant' displaying each of the patterns. Performance patterns were presented one point at a time (i.e., in a sequential manner). The results of this study showed that people inferred greater ability from the descending pattern of success (i.e., declining performance), compared to the random or ascending (i.e., improving performance) pattern. The authors explained that participants experienced a primacy effect, whereby the initial level of success biased their memory for subsequent success levels. Hence, those who began at a high level and declined over time were perceived to have greater intellectual ability than those who began at a low level of success and improved over time. Jones and Welsh (1971) demonstrated the reversal of these effects. Specifically, they showed that in the context of strategic play, recency effects could emerge leading people to attribute greater ability to those displaying increasing levels of success. The context of a strategic game may be unique in that it places a great weight on the final standing (whether the player ended up winning or losing). Hence, a recovery from losses

(i.e., ascending pattern of outcomes) may be seen as an indicator of ability in this domain. It is important to note that the reviewed studies by Jones and colleagues (1968; 1971) presented the outcomes in a sequential manner; participants were not presented with the full record of performance at any point in time. The presentation format used in these studies triggered a reliance on memory when judging the overall performance pattern. Therefore, as explained above, the resulting judgments were greatly influenced by memory-based processes. These processes would not be applicable to the judgments studied in the present research where participants view full performance records so they do not need to construe the records from memory.

The reviewed studies (Jones et al., 1968; Jones & Welsh, 1971) showed that the domain of performance (problem solving versus strategic play) may moderate the effects of temporal trajectories on attributional judgments of ability. Butler (2000) examined another moderating variable of these effects. Specifically, the author tested whether lay theories of intelligence (Dweck & Leggett, 1988) determine whether high school students perceive initial performance levels or last performance levels to be most diagnostic of another high school student's math ability. The studies focused on judgments concerning improving and declining patterns of performance, with the average performance being held constant. The findings showed that entity theorists, who perceive intelligence to be fixed, tend to view initial performance levels as more diagnostic and to infer greater ability in a declining pattern of performance. In contrast, incremental theorists, who think that intelligence is changeable, tend to view final performance levels as more diagnostic and to infer greater ability in an improving pattern of performance. These results applied to judgments of the self and others. Butler (2000) also examined judgments of effort;

unlike ability judgments, effort judgments were not moderated by lay theories. Moreover, the study compared effort and ability judgments for the first and the last performance outcomes in each profile. In an improving profile, both effort and ability judgments were higher for the last (versus the first) outcome. In the declining profile, ability judgments were lower for the last (versus the first) outcome, whereas effort judgments did not differ. Notably, the results do not show whether, overall, effort attributions were different for the improving than for the declining profile. Taken together, the reviewed studies explored the influence of intertemporal trends on attributional judgments (Butler, 2000; Jones, Rock, Shaver, Goethals, & Ward, 1968; Jones & Welsh, 1971), with a focus on attributions of ability. More research is needed to understand the influence of intertemporal performance trends on attributions of effort.

Another line of attribution research examined the consequences of attributional judgments. Attributing personal success or failure to effort was shown to increase motivation and persistence in the face of failure, particularly with tasks that are moderately difficult (Weiner et al., 1972). Attributing others' failure to low effort was shown to result in greater punishment/lower reward than attributing it to low ability, and attributing success to high effort resulted in lower punishment/greater reward than attributing it to high ability (Weiner & Kukla, 1970). Moreover, past research documented a trade-off between attributions of ability and attributions of effort (e.g., Heider, 1958; Jones, 1989). With performance level being constant, the more the performance is attributed to effort, the less it would be attributed to ability (and vice versa).

A more general question that captured the interest of social psychologists concerns the evaluations of high effort investments by the self and others, and of the outcomes associated with these investments. There is considerable evidence suggesting that effort investments can result in favourable judgments. For example, people value products that they have successfully created themselves and invested some effort in, and this has been labelled "the IKEA effect" (Norton, Mochon, & Ariely, 2012). Likewise, people evaluated a poem or a painting more favourably when they were told that the artist put a lot of time and effort into it (Kruger et al., 2004). The tendency to use effort as a cue indicating quality or value of outputs produced by others has been labeled "the effort heuristic" (Kruger et al., 2004). In line with this, consumer research shows that when a company invests apparent effort in production or product displays (controlling for the actual quality of products), consumers evaluate the company more favourably and indicate greater willingness to pay for its products - as long as the company's persuasion motive is not made salient (Morales, 2005). While these studies suggest that perceptions of high effort would translate into favourable evaluations, there is some research suggesting that this may not always be the case.

Building upon the work on "the effort heuristic", Cho and Schwarz (2008) examined one variable that could determine whether high effort exerted by an artist would lead to inferences of higher quality of the artistic end product or not. Specifically, the authors examined the moderating role of naïve theories that people may have concerning effort. They reasoned that people may have the naïve theory that "good-art-takes-effort". When this theory is activated, high effort investments by the artist would lead evaluators to infer higher quality of the end product- in line with the findings of

Kruger and colleagues (2004). Alternatively, people may also have the naïve theory that "good-art-takes-talent". When this alternative theory is activated, high effort investments would not lead evaluators to infer higher quality of the artistic end product. Moreover, when guided by the "good-art-takes-talent" theory, people may perceive low effort to reflect greater talent and better quality of the end product compared to no effort information (but not compared to high effort information). Hence, the same piece of information (e.g., high or low effort investments) may lead to vastly different inferences depending on the accessible naïve theory that is applied. Two empirical studies supported these hypotheses. These studies suggested that high effort can be interpreted in multiple ways and that it does not always translate into favourable overall judgments.

Furthermore, studies by Tsay and Banaji (2011) showed that people hold the belief that artists who demonstrate early signs of effort and perseverance (strivers) will be higher achievers than artists with early signs of natural talent (naturals). Interestingly, however, the same set of studies showed that people's *actual* choices and preferences in a decision-making context revealed the opposite pattern whereby naturals were preferred over strivers. This effect has been labelled "the naturalness bias" (Tsay & Banaji, 2011), and it demonstrates another case where effort perceptions may not translate into favourable judgments. In line with this, Jones (1989) emphasized the trade-off between attributions of ability and effort, and argued that individuals tend to emphasize their natural competence and ability (i.e., stable attributions) rather than their effort (which can be viewed as variable) when engaging in self-promoting strategies. He also presented the following anecdotal example, which suggests that emphasizing ability is a more effective promotional strategy than emphasizing effort:

"In evaluating potential graduate students, how completely we ignore letters of recommendation that emphasize hard work and a pleasing personality" (Jones, 1989, p. 479).

Taken together, the reviewed literature provides considerable evidence supporting the idea that effort perceptions could translate into favourable evaluations (Kruger et al., 2004; Morales, 2005; Norton et al., 2012), but it also presents some examples suggesting that this may not always be the case (Cho & Schwarz, 2008; Jones, 1989; Tsay & Banaji, 2011). Overall, the studies suggest that effort could be interpreted and evaluated in different ways. Oftentimes, effort investments tend to be valued as signs of motivation, and to reflect positively on judgments of the products of effort as well as the producers. There are other times, however, when effort investments may suggest a lack of talent or natural ability, resulting in less positive evaluations, particularly in contexts where talent and natural ability are weighed heavily. Notably, the current empirical evidence supporting the latter view of effort focused on judgments and decisions made within artistic domains (Cho & Schwarz, 2008; Tsay & Banaji, 2011). In such domains, the naturalness of talent may be particularly valued over hard work. Less is known about the kinds of evaluations that result from judgments of effort in the non-artistic performance domains that we examine in the present research (e.g., performance of software developers, sales associates, science students, etc.). For instance, would perceiving a software developer to be hardworking be accompanied by a judgment that he/she has a low level of ability? When considering this hardworking developer for a promotion, would evaluators consider him/her as more deserving than another developer who is

viewed as less hardworking? These are among the questions that we are interested in exploring in the present research.

The Present Research

In the present research, we explore the influence of temporal patterns of performance on effort perceptions and subsequent evaluations. Specifically, we examine perceptions of effort in the context of comparisons of an improved and a consistent performance profile, with the final performance level being constant. People tend to associate improvement with hard work and effort. Hence, we test the novel proposition that people use improvement as a heuristic for effort, and hence devalue the amount of effort underlying consistent strong performance. When presented with an improved and a consistent profile with identical final performance, we expect that people would think that the improved profile reflects a greater investment of effort and a more hardworking character than the consistent profile. We also examine whether these judgments of effort would translate into more favourable judgments of deservingness in decisions that involve these two types of performance records (e.g., deservingness for a promotion opportunity). Additionally, in all studies, we assess participants' perceptions of trait competence (i.e., ability) of the targets as well as trait effort to explore whether perceptions of higher effort investments in the improved profile would be accompanied with perceptions of lower competence and ability, relative to the consistent profile. If that is the case, it is possible that the higher effort judgements of the improved profile may not translate into judgments of higher deservingness of future opportunities.

We examine these questions in six studies and then we present a meta-analysis of the findings. In our first study (Studies 1A, 1B, and 1C) we test the basic hypothesis concerning effort judgments. Then, in Studies 2 and 3, we introduce procedures that highlight strengths of the consistent profile (higher average performance, superior performance at specific time points), and test whether the judgment of improvement as reflecting greater effort investments would be maintained under these conditions. In Study 3, we also examine whether judgments of effort would translate into an overall preference for improvement over consistency in a decision-making context (employee promotions). In Study 4, we examine whether participants would spontaneously mention effort more frequently when supporting the profile of an improved (vs. a consistently-strong) candidate for an award. Building upon the premise that heuristics are employed in ambiguous decision contexts, we then test whether the level of ambiguity of the decision context would influence the degree to which people use improvement to make effort judgments (Study 5 and Study 6). In most of these studies (Studies 1-5), we focus on joint evaluation contexts, whereby the target profiles are presented side-by-side and are being evaluated simultaneously. We reasoned that, oftentimes, in hiring and selection decisions, decision makers evaluate and compare more than one candidate. Hence, this mode of evaluation reflects the types of judgments that are often made in various real world settings. In Study 6, however, we examine whether evaluators' use of improvement to infer effort would be generalizable to separate evaluation contexts, in which each participant would only evaluate one target profile. Finally, we conducted a meta-analysis (Study 7) to assess the overall strength of the effects obtained in the current set of studies.

Studies 1A-1C

In the first set of studies (1A-1C), we examined the basic question concerning the influence of improvement on effort judgments. Specifically, would evaluators think that an improved target has invested greater effort and is more hardworking than a consistently-strong target? We sought the answer to this question using students (Study 1A), software developers (Study 1B), and course instructors (Study 1C) as targets of evaluation to examine the applicability of our propositions across these diverse contexts.

Study 1A: Student Profiles

Method

Participants. Seventy-three undergraduate students from Wilfrid Laurier University (12 male, 56 female, 1 other, 4 unidentified; $M_{age} = 18.93$, $SD = 2.26$; 15 Asian, 1 Black/African American, 42 White, 10 other, 5 unidentified) participated in this study. They were recruited through the psychology department research participants pool and they completed the study online in exchange for course credit.

Procedure. Participants were invited to complete an online questionnaire examining their opinions and evaluations of other students. After completing a consent form, participants were presented with the profiles of two undergraduate students, including graphs depicting the students' grade point averages for each term in university (See Appendix A). The graphs indicated that both students received an equally strong grade point average (A) in the last term, but one student had always performed at that level whereas the other had started with a B- average and improved steadily over time. The two profiles were presented side-by-side and the location on the screen (left versus

right side) was counterbalanced across participants. Also, the peripheral content in the profiles (e.g., student name, major, hobbies) was counterbalanced so that each profile was paired equally-often with the improved and consistent performance records. Participants then completed a series of measures concerning their views of the students, including the measures pertaining to this thesis research.[1] As a measure of perceived effort, participants were asked to indicate how much effort they thought that each of the students has spent in studying for her university courses (1 = no effort at all, 7 = a lot of effort). Then, participants were told that we were interested in the first impression that they formed of the two students. They were presented with 14 seven-point scales with end points labelled with two opposite traits (e.g., hardworking vs. lazy). Four scales were related to effort (hardworking vs. lazy, motivated vs. not motivated, persistent vs. not persistent, determined vs. not determined). The remaining scales assessed judgments of warmth (warm vs. cold, likable vs. unlikable, outgoing vs. shy, an extrovert vs. an introvert), competence (competent vs. not competent, smart vs. stupid, intelligent vs. not intelligent), success (successful vs. not successful), and ambition (ambitious vs. not ambitious). Participants also rated the overall positivity of their first impression of the student (1= very negative, 7= very positive). Finally, participants completed additional exploratory measures and provided demographic information[2].

Results

Our primary hypothesis was that participants would rate perceived effort as higher for the improved than for the consistent student. Consistent with this hypothesis, a paired t-test performed on the ratings of perceived effort revealed that participants thought that the improved student invested more effort in school ($M = 6.22$, $SD = 0.97$) than the

consistently-strong student ($M = 5.81$, $SD = 1.21$), $t(71) = 1.98$, $p = .05$, $d = 0.38$. We also computed an index of effort-related traits (Cronbach's $\alpha = .65$ for the improved student and .83 for the consistent student). Participants rated the improved student higher on effort-related traits ($M = 6.44$, $SD = 0.64$) than the consistent student ($M = 5.96$, $SD = 0.88$), $t(72) = 3.58$, $p = .001$, $d = 0.63$. Similarly, we computed an index of trait competence (Cronbach's $\alpha = .77$ for the improved student and .73 for the consistent student) and compared ratings of the improved and consistent profiles on this index. Participants rated the consistent student higher in terms of competence ($M = 6.47$, $SD = 0.66$) than the improved student ($M = 6.09$, $SD = 0.82$), $t(72) = 4.44$, $p = .001$, $d = 0.50$ (See Tables 1a and 1e for mean ratings and standard deviations of judgments in this study, Study 1B, and Study 1C).

We also examined the correlations among the different types of judgments. Overall, effort perceptions, trait effort, and trait competence were positively correlated (See Table 1b). This was true for judgments of the improved (See Table 1c) and the consistent (See Table 1d) profiles in Studies 1A, 1B, and 1C.

Study 1B: Employee Profiles

Method

Participants. Eighty adults from the United States (42 male, 34 female, 4 unidentified; $M_{age} = 37.61$, $SD = 13.77$; 5 Asian, 7 Black/African American, 5 Hispanic or Latino, 56 White, 3 other, 4 unidentified) were recruited through Amazon Mechanical Turk (MTurk) and completed the study online in exchange for $0.50.

Procedure. Participants were invited to complete an online questionnaire examining their opinions and judgments of employee profiles. After completing a consent form, participants were presented with the profiles of two Software Developers in a high technology company. The profiles included the employees' names and dates of birth. Participants were told that the two employees had joined the company at the same time (five years ago) and had received annual performance evaluations from their supervisors. Participants then viewed two graphs displaying the employees' annual performance evaluations over the past five years rated on a scale from 1 (poor performance) to 10 (outstanding performance; see Appendix C). The graphs indicated that both employees had received an equally-strong performance evaluation in the past year (final point on the graph: 8.5/10), but one employee had always performed around that level whereas the other had started with an evaluation of only 6/10 and improved steadily over time. The two profiles were presented side-by-side and the location on the screen (left versus right side) was counterbalanced. Also, the peripheral content (employee name and date of birth) was counterbalanced across participants so that each profile was paired equally-often with the improved and consistent performance records. Participants then completed several rating scales concerning their perceptions of the employees. As a measure of perceived effort, they were asked to indicate how much effort they thought that each of the employees has spent on the job in the past five years (1 = no effort at all, 7 = a lot of effort). Then, participants reported their impressions of the two employees on the same trait rating scales that were used in Study 1A. The scales assessed trait effort, warmth, competence, success, ambition, and overall positivity. At the end of the study, participants reported demographic information.

Results

Consistent with the hypothesis, participants thought that the improved employee invested more effort in the job ($M = 6.26$, $SD = 0.91$) compared to the consistent employee ($M = 5.20$, $SD = 1.12$), $t(75) = 7.09$, $p < .001$, $d = 1.04$. Similarly, on the index of trait effort (Cronbach's $\alpha = .92$ for each of the improved and the consistent employees), participants rated the improved employee higher ($M = 6.32$, $SD = 0.85$) than the consistent employee ($M = 5.23$, $SD = 1.13$), $t(76) = 7.99$, $p < .001$, $d = 1.08$. On the index of trait competence (Cronbach's $\alpha = .93$ for the improved employee and .89 for the consistent employee), however, participants' ratings of the improved employee ($M = 6.07$, $SD = 0.92$) did not differ significantly from their ratings of the consistent employee ($M = 5.98$, $SD = 0.92$), $t(76) = 0.95$, $p = .35$, $d = 0.10$.

Study 1C: Rate My Professor

Method

Participants. One-hundred and seven undergraduate students (26 male, 73 female, 8 unidentified; $M_{age} = 19.99$, $SD = 4.17$; 10 Asian, 4 Black/African American, 3 East Indian, 1 Hispanic or Latino, 72 White, 8 other, 9 unidentified) participated in this study. They were recruited through the psychology research participants pool at Wilfrid Laurier University and completed the study online in exchange for course credit.

Procedure. Participants were invited to complete an online questionnaire titled "Rate My Professors". After completing a consent form, participants viewed the profiles of two psychology course instructors including the reviews that each of the instructors had ostensibly received on a professor rating website (similar to reviews on the website

www.ratemyprofessors.com) in each of the past three years. The trends depicted

improvement for the one profile and consistent high reviews for the other, with the final

overall review of teaching quality being 4.1/5 for both (See Appendix D). Similar to the

previous studies, the two profiles were presented side-by-side, and the location on the

screen and names of instructors were counterbalanced across participants. Participants

reported the amount of effort they thought that each of the instructors has spent in her

teaching job in the past three years (1 = no effort at all, 7 = a lot of effort), and rated their

first impressions of the two instructors using the same trait rating scales that were used in

the previous studies. Finally, participants reported minimal demographic information

(age and gender).

Results

Participants thought that the instructor with improved ratings had put more effort

into her teaching job ($M = 6.13$, $SD = 0.88$) compared to the one who received

consistently-strong ratings ($M = 4.81$, $SD = 1.17$), $t(103) = 8.98$, $p < .001$, $d = 1.28$.

Similarly, on the index of trait effort (Cronbach's $\alpha = .86$ for the improved instructor and

.90 for the consistent instructor), participants rated the improved instructor higher ($M =$

6.21, $SD = 0.77$) than the consistent instructor ($M = 5.17$, $SD = 1.02$), $t(102) = 9.94$, $p <$

.001, $d = 1.14$. On the index of trait competence (Cronbach's $\alpha = .77$ for the improved

instructor and .82 for the consistent instructor), however, participants' ratings of the

improved instructor ($M = 5.89$, $SD = 0.86$) and their ratings of the consistent instructor

($M = 5.88$, $SD = 0.88$) did not significantly differ, $t(102) = 0.13$, $p = .90$, $d = 0.01$.

To examine whether the items comprising the trait effort and trait competence indices in these studies represent two distinguishable sets of traits, we conducted Confirmatory Factor Analyses (See Appendix E). First, we combined the data from Studies 1A-1C, and then specified and tested the structural model for each of the improved and the consistent profiles. The results indicated that the model fit was adequate for improved profiles and excellent for consistent profiles, thus confirming the factor structure with four items measuring effort (hardworking, motivated, persistent, and determined) and three items measuring competence (competent, smart, and intelligent). These indices of trait effort and trait competence were used in subsequent studies.

Study 2: Focusing on the Average versus the Trend

In the previous studies, we demonstrated that, across different contexts, participants thought that a profile depicting improved performance reflects a greater investment of effort compared to one depicting consistent strong performance. Notably, the consistent profiles used in these studies had a higher performance level on average than the improved profiles, and at no point in time displayed lower performance than the improved profiles. It would have been reasonable to infer that the consistently-strong performer must have always worked hard. Hence, these three studies employed a conservative test of the hypothesis, and they provided convergent evidence that people tend to associate improvement, rather than consistency, with hard work and effort.

It could be argued that performance trends (i.e., improvement vs. consistency) were highly salient in these profiles, particularly in Study 1A and Study 1B where performance evaluations were presented on a graph. This presentation format may have

emphasized temporal change and thus drawn attention away from the fact that, on average, the consistent performer had outperformed the improved performer. As a result, it is possible that participants did not pay sufficient attention to the overall level of performance in the profiles, and hence they devalued the amount of effort underlying consistent strong performance. Indeed, past research suggests that when change is highly salient, people tend to place a greater weight on velocity (i.e., rate of change) than on position (e.g., level of performance) (Hsee, Abelson, & Salovey, 1991) when making various judgments and decisions. In Study 2, we manipulated participants' focus on trends versus average performance level and tested whether this would moderate effects of improvement on perceived effort.

Method

Participants. One-hundred and twelve undergraduate students were recruited from the psychology research participants pool at Wilfrid Laurier University (28 male, 76 female, 8 unidentified; $M_{age} = 19.81$, $SD = 2.73$; 21 Asian, 1 Black/African American, 4 East Indian, 64 White, 15 other, 7 unidentified). They completed this study online in exchange for course credit.

Procedure. In this study, participants were randomly assigned to one of three focus conditions: average focus, trend focus, or a control condition. Participants were presented with the profiles of two software developers in a high technology company. The profiles were similar to those used in Study 1B. Again, the profiles included minimal information about the employees (names and dates of birth) as well as their annual performance evaluations over the past five years. Unlike Study 1B, performance

evaluations were presented in tabular format (See Appendix F). The final performance

evaluation for both employees was 8.5/10 (rated on a scale from 1 [poor performance] to

10 [outstanding performance]), but one employee had always performed around that level

whereas the other had started with an evaluation of only 5.7/10 and improved over time.

The two tables were presented side-by-side, and both the location on the screen and the

peripheral content of the profiles were counterbalanced across participants. Participants

in the average focus condition were then instructed to calculate the average performance

evaluation for each of the two employees. Participants in this condition were provided

with a calculator on the screen and were reminded of how an average is computed.

Participants in the trend focus condition were instructed to describe the overall

performance trend for each of the two employees. Participants in the control condition

did not complete either of these tasks. After that, all participants were asked to report

their perceptions of the amount of effort that each of the employees has spent on the job

in the past five years (1 = no effort at all, 7 = a lot of effort). Then, participants rated their

impressions of the traits of the two employees using the trait rating scales from the

previous studies. Finally, participants provided demographic information.

Results

     Perceived effort. We submitted the perceived effort ratings to a 3 (Focus:

average vs. trend vs. control) × 2 (Profile: improved vs. consistent) mixed analysis of

variance (ANOVA). The main effect of profile was significant, $F(1, 107) = 14.89$, $p <$

.001, $d = 0.64$, indicating that participants thought that the improved employee invested

greater effort ($M = 5.96$, $SD = 1.26$) than the consistent employee ($M = 5.18$, $SD = 1.19$).

No other effects were significant. Importantly, the thought focus × profile interaction was

not significant, $F(2, 107) = 0.11$, $p = .90$. This suggests that, regardless of their thought focus, participants rated the improved employee as having invested greater effort than the consistent employee (See Table 2a for mean ratings and standard deviations in each of the three conditions).

Trait effort. We also submitted the trait effort index (Cronbach's $\alpha = .85$ for the improved employee and .86 for the consistent employee) to a 3 (Focus: average vs. trend vs. control) × 2 (Profile: improved vs. consistent) mixed ANOVA. Again, the main effect of profile was significant, $F(1, 106) = 35.18$, $p < .001$, $d = 0.88$. Participants rated the improved employee higher on effort-related traits ($M = 6.15$, $SD = 0.91$) than the consistent employee ($M = 5.30$, $SD = 1.02$). No other effects were significant. Importantly, the thought focus × profile interaction was not significant, $F(2, 106) = 0.69$, $p = .50$. This suggests that the improved employee was rated higher on effort-related traits than the consistent employee, regardless of the thought focus condition that participants were assigned to.

Trait competence. We submitted the index of trait competence (Cronbach's $\alpha = $ .83 for the improved instructor and .79 for the consistent instructor) to a 3 (Focus: average vs. trend vs. control) × 2 (Profile: improved vs. consistent) mixed ANOVA. Only the main effect of profile was significant ($F[1, 105] = 18.99$, $p < .001$), indicating that the consistent employee was perceived to be more competent ($M = 5.99$, $SD = 0.69$) than the improved employee ($M = 5.58$, $SD = 0.88$), $d = 0.52$. No other effects were significant.

Correlations among the main dependent measures in this study are presented in Tables 2b-2d. The mean ratings and standard deviations of the items comprising trait effort and trait competence are presented in Table 2e.

Study 3: Unpacking Effort Judgements

The previous studies provided converging evidence supporting the hypothesis that people use improvement as a heuristic for effort, and hence devalue the amount of effort underlying consistent strong performance. Furthermore, Study 2 provided evidence that this devaluation of effort is not just the result of overlooking performance levels because of the relative salience of performance trends. One goal of the current study is to test whether the differences in effort judgments across profiles have implications in decision-making contexts. Specifically, would judging an improved employee as having invested greater effort than a consistently-strong employee result in favouring the former for a promotion, even though the latter has displayed stronger overall performance? A second goal of the current study is to further explore the possibility that participants may have overlooked differences in performance levels. This time, we introduce a manipulation of temporal unpacking of effort judgements to ensure that participants pay attention to differences in performance levels at individual time points. We test whether introducing this unpacking manipulation would attenuate the effect of improvement on effort judgments.

Method

Participants. The sample consisted of 105 adults (44 male, 55 female, 6 unidentified; $M_{age} = 36.60$, $SD = 13.16$; 4 Asian, 5 Black/African American, 1 East

Indian, 4 Hispanic or Latino, 87 White, 1 other, 3 unidentified) who completed the study

online. Participants were recruited through MTurk and compensated with $0.50.

Procedure. Participants were presented with the employee profiles used in Study

1B. We randomly assigned participants to a temporal unpacking condition or a control

condition. In the unpacking condition, participants were first asked to judge the amount

of effort that each of the employees put into his work in each of the five years depicted on

the graph. That is, participants rated their judgments using slider bar measures with the

ends labelled 0 (no effort at all) and 100 (a lot of effort). Participants in the control

condition did not complete this unpacking task. After that, all participants were asked to

indicate the *overall* amount of effort invested by each of the employees over the past five

years. Again, responses were provided using a slider bar measure with the ends labelled 0

(no effort at all) and 100 (a lot of effort). Participants also rated their impressions of the

employees' traits on the same trait rating scales used in earlier studies. Next, participants

were presented with a scenario and were told to imagine it as if it was actually taking

place. Specifically, they were told to imagine that they were part of a selection committee

at the company in which the two employees worked. The company is offering

a promotion opportunity to one of its current software developers and the two employees

are the candidates for this position. Participants then indicated how deserving each of the

two employees was of this promotion opportunity (1 = not at all deserving, 7 = very

deserving). They were also asked to indicate their preference on a slider bar with the mid-

point labelled "I have no preference" and each of the end points indicating a definite

preference for one of the employees over the other. Finally, participants completed

demographic questions.

Results

      Perceived effort. Judgments of the overall effort invested over the five years were submitted to a 2 (unpacking condition: unpacking vs. control) × 2 (profile: improved vs. consistent) mixed ANOVA. The analysis revealed a significant main effect of profile, $F(1, 103) = 23.48$, $p < .001$, $d = 0.72$. Participants thought that the improved employee invested greater effort over the five years ($M = 80.92$, $SD = 12.76$) compared to the consistent employee ($M = 69.10$, $SD = 19.68$). The main effect of unpacking was not significant, $F(1, 103) = 0.20$, $p = .66$. Moreover, the interaction effect was not significant, $F(1, 103) = 0.003$, $p = .95$. Hence, the unpacking manipulation did not attenuate the use of improvement as an indicator of perceived effort over the five years.

      Perceptions of the effort that the employees invested in each of the five years (obtained from participants in the unpacking condition) are presented in Table 3b. The pattern of results indicated that perceived effort progressively increased for the improved profile, but it declined for the consistent profile. Effort perceptions were analyzed in a 2(profile: improved vs. consistent) × 2(year: first vs. fifth) repeated-measures ANOVA. The interaction effect was significant, $F(1,52) = 27.06$, $p < .001$. For the improved profile, perceived effort was greater in the fifth year than in the first year ($t(52) = 5.42$, $p < .001$); whereas for the consistent profile, perceived effort was lower in the fifth year than in the first year ($t(52) = -3.01$, $p = .004$). Perceptions of effort investments in the first year were slightly, though non-significantly, higher for the consistent than for the improved profile, $t(52) = -1.55$, $p = .13$. In the final year, however, participants perceived greater effort investments by the improved than the consistent employee ($t(52) = 4.76$, $p < .001$) even though their performance level was identical in that year.

Trait effort. Judgments of trait effort (Cronbach's $\alpha = .93$ for the improved profile and .89 for the consistent profile) were also submitted to a 2 (condition: unpacking vs. control) × 2 (profile: improved vs. consistent) mixed ANOVA. Again, there was a main effect of profile, $F(1, 103) = 70.77$, $p < .001$. Participants rated the improved employee higher on effort-related traits ($M = 6.17$, $SD = 0.85$) than the consistent employee ($M = 4.77$, $SD = 1.33$), $d = 1.26$. The main effect of unpacking was not significant, $F(1, 103) = 0.58$, $p = .45$, and the interaction effect was also not significant, $F(1, 103) = 1.75$, $p = .19$. This suggests that the unpacking manipulation did not attenuate the reliance on improvement when judging how hardworking the employees are.

Trait competence. The index of trait competence (Cronbach's $\alpha = .80$ for the improved profile and .76 for the consistent profile) was submitted to a 2 (condition: unpacking vs. control) × 2 (profile: improved vs. consistent) mixed ANOVA. None of the effects were significant in this analysis (See Table 3a for mean ratings and standard deviations for different types of judgment in this study).

Deservingness for promotion. We submitted ratings of deservingness for the promotion to a 2 (condition: unpacking vs. control) × 2 (profile: improved vs. consistent) mixed ANOVA. The pattern of results was similar to that obtained with effort. Specifically, participants viewed the improved candidate as more deserving of promotion ($M = 5.84$, $SD = 1.01$) than the consistent candidate ($M = 5.18$, $SD = 1.48$), $F(1, 102) = 12.24$, $p = .001$, $d = 0.52$. This effect was not moderated by the unpacking manipulation, $F(1, 102) = 0.12$, $p = .73$. The main effect of unpacking was also not significant, $F(1, 102) = 1.99$, $p = .16$.

We also examined responses provided on the slider bar measure of relative preference (recoded such that higher numbers indicated greater preference for the improved relative to the consistent) profile. Responses were compared to a value of 50, which denotes having no preference for one profile over the other. This analysis provided additional evidence that participants preferred to award the promotion to the improved employee in both the unpacking ($M = 61.92$, $SD = 34.48$, $t(52) = 2.52$, $p = .02$) and the control ($M = 61.25$, $SD = 26.97$, $t(51) = 3.01$, $p < .01$) conditions. An additional t-test indicated that the preference ratings did not differ across the two unpacking conditions, $t(103) = -0.11$, $p = .91$, $d = 0.02$.

Mediation by perceived effort. To examine whether deservingness judgments of the profiles were driven by effort perceptions, we followed the procedure recommended by Judd, Kenny, and McClelland (2001) for testing mediation in within-subjects designs. First, we computed difference scores (improved –consistent) for the measures of perceived effort and deservingness. For each participant, we also computed the sum of perceived effort ratings of the improved and consistent profiles. For each of the unpacking conditions, a regression analysis was conducted with the difference in deservingness as the outcome variable, the difference in effort as predictor, and the sum of effort ratings as a control variable. The deservingness of the improved employee (relative to the consistent employee) was significantly positively related to effort perceptions in both the unpacking ($B = .07$, $t(50) = 5.89$, $p < .001$) and the control ($B = .04$, $t(48) = 5.12$, $p < .001$) conditions. This finding suggests that perceived effort mediated the impact of temporal profile on deservingness judgments. Zero-order correlations of the difference scores included in this analysis are presented in Table 3c

(Tables 3d and 3e show the correlations for the improved and the consistent profiles, respectively). Table 3g presents the detailed results of the mediation by perceived effort.

Mediation by trait effort. To examine the relationship between deservingness and trait judgements, we used the same mediation procedure outlined above. The main objective was to test whether judgments of trait effort would drive deservingness ratings, when the variations in ability and warmth judgments are controlled for. First, we computed difference scores (improved – consistent) for the trait indices of effort, competence, and warmth. Likewise, we computed the sums (improved + consistent) for each of the three indices. For each of the unpacking conditions, a regression analysis was conducted with the difference in deservingness as the outcome variable and the differences on the trait indices as predictors (controlling for the sums for each of the indices). The detailed results of this analysis are presented in Table 3h. As hypothesized, the difference in trait effort predicted the difference in deservingness in both the unpacking ($B = 0.76$, $t(46) = 5.55$, $p < .001$) and the control ($B = 0.57$, $t(44) = 3.97$, $p < .001$) conditions, indicating that judgments of trait effort played a mediating role in driving deservingness ratings, even when the other types of traits (competence and warmth) were controlled for.

Overall, the results of Study 3 showed that the differences in effort judgments between the improved and consistent profiles may have implications for decision-making. Not only was the improved employee judged to be more hard working and to have put more effort, but he was also viewed as more deserving of promotion than the consistent employee. Perceptions of the amount of effort invested by the employees in the past, as well as judgments of their trait effort, explained the differences in deservingness

judgments. The study also showed that unpacking effort judgements did not weaken the effect of improvement on effort judgments and deservingness. Taken together, Studies 2 and 3 suggest that attempts to focus evaluators' attention on the strengths of non-improved profiles may not be effective for reducing the use of improvement as a heuristic for judging effort in these joint evaluation contexts. These findings attest to the robustness of the association between improvement and effort.

Study 4: Spontaneous Judgements

When comparing the improved and the consistently-strong profiles in Study 3, evaluators perceived greater effort in the improved profile, and hence favoured that profile for a promotion opportunity. Of particular note, participants were directly asked to report their judgments of effort on the provided rating scales before judging the deservingness of the employees for the promotion. It is possible that participants only considered judgments of effort because they were provided with these items to respond to, but would evidence of improvement (vs. consistency) in performance spontaneously trigger inferences about effort in absence of these items? Addressing this question would provide a stronger test of the proposition that improvement and effort are highly associated; and that this association underlies the differences in judgments across the two profiles of interest.

In Study 4, we tested whether people spontaneously think of effort when advocating someone with improved (versus consistently-strong) performance. To examine this question, we showed participants two performance profiles of candidates for an employment award: one showing performance that is consistently-high and the other

showing performance that improves over time to that high level. Participants were randomly assigned to support one of the two candidates, and to provide reasons why that candidate should win the award. The question was open-ended and it made no reference to effort. We predicted that participants would spontaneously mention effort more frequently when supporting the profile of the improved (versus consistently-strong) candidate for the award.

Method

Participants. One hundred and eleven adults from the United States participated in this study (57 male, 51 female, 3 unidentified, M_{age} = 34.96, SD = 13.07; 14 Asian, 4 Black/African American, 6 Hispanic or Latino, 82 White, 5 unidentified). They were recruited through MTurk and they completed this study online in exchange for $0.50.

Procedure. Participants were presented with the two employee profiles used in Study 1B and Study 3. Again, the peripheral content of the profiles and the location on the screen (left versus right side) were counterbalanced across participants. Participants were told to imagine that they were part of a selection committee examining the profiles of employees who are candidates for an employment award. Participants were then randomly assigned to support one of the two profiles; they were told that they should convince other committee members that this employee should win the award. Specifically, participants received the following instructions:

"Imagine that you have selected Andrew (John), who has displayed consistent (improved) performance, to win this award. Now, imagine that you are trying to explain the rationale behind your choice to the rest of the selection committee

members. Please support the above decision by explaining why Andrew's

(John's) performance pattern makes him more deserving of the award. We are

interested in all the different reasons that you could think about as you are

justifying this decision. We would like you to think deeply about these reasons and

to go beyond describing the performance patterns that are displayed on the graph."

Participants were asked to type the reasons that they thought of. Participants were

also asked to indicate how difficult it was to come up with arguments supporting the

profile they were assigned (1 = not at all difficult, 7 = very difficult) and to rate how

convincing they think the arguments that they came up with were (1 = not at all

convincing, 7 = very convincing). Then, they completed demographic questions.

Results

Participants rated the difficulty of coming up with arguments equally for the

improved ($M = 3.07$, $SD = 1.67$) and consistent ($M = 3.20$, $SD = 1.80$) profiles, $t(107) =$

0.38, $p = .71$, $d = 0.07$. They also thought that the arguments that they came up with for

the improved ($M = 5.09$, $SD = 1.17$) and consistent ($M = 5.02$, $SD = 1.33$) profiles were

equally convincing, $t(107) = -0.31$, $p = .76$, $d = 0.06$.

Participants' responses were coded by a research assistant who was blind to the

hypotheses. The research assistant read each of the responses provided by participants

and indicated whether or not the participant had made reference to effort as a reason why

the employee should win the award (1 = effort is mentioned, 0 = effort is not mentioned),

and whether or not they made reference to ability as a reason (1 = ability is mentioned, 0

= ability is not mentioned). The coder was provided with a list of words and phrases that

are synonymous with effort (e.g., hard work, persistence) and ability (e.g., competent,

talented, smart). Examples of responses where effort was mentioned include: "[Andrew]

has worked hard from day one and continues every day", and "[John] has made a

conscious effort to improve each year". Examples of responses where ability was

mentioned include: "[Andrew]'s performance shows his quality of ability... He is stable,

intelligent and works well under pressure", and "For [John] to show consistent

improvement is a strong sign that he is committed, capable, smart and enthusiastic".

Overall, the results indicated that a greater proportion of participants mentioned effort

when supporting the improved employee than when supporting the consistent employee

(44.6 % vs. 23.6 %), *Chi-square* $[1, N = 111] = 5.44$, $p = .02$, $d = 0.45$. In contrast, there

was a tendency to mention ability more frequently when supporting the consistent

employee than when supporting the improved employee (16.4% vs. 5.4%), but the

difference was only marginally significant, *Chi-square* $[1, N = 111] = 3.49$, $p = .06$, $d =$

0.36 (See Table 4).

To assess the reliability of the coding scheme, a second rater independently coded

a sample of 57 responses. The two raters agreed on 86% of responses for effort (*Cohen's*

Kappa = .69, $p < .001$) and 93% of responses for ability (*Cohen's Kappa* = .76, $p < .001$).

Study 5: The Role of Ambiguity

We have characterized people's tendency to infer effort from evidence of

improvement as a cognitive heuristic. One hallmark of heuristics is that people tend to

utilize them to a greater degree in decision contexts that are more ambiguous (Gilovich et

al., 2002; Kruger et al., 2004; Tversky & Kahneman, 1974). Note that in previous studies

the profiles had considerable ambiguity. For example, participants did not know what a typical performance level was in the given contexts and where the targets' performance stood relative to that typical level. The goal of Study 5 is to test whether ambiguity would influence people's reliance on the improvement-effort heuristic. To manipulate ambiguity, we created profiles involving a context that was probably unfamiliar to participants (sales of electric heating systems) and manipulated whether we provided them with a reference point that would help them to interpret the information in the profiles; specifically, we presented them with the average level of performance in the given domain. We predicted that when the reference point is provided (i.e., lower ambiguity), participants would base their judgments on comparisons of performance levels to that reference point and would rely less on the improvement-effort heuristic. In contrast, when the reference point is not provided (higher ambiguity), participants would use improvement as a heuristic for effort as in the previous studies.

Method

Participants. The final sample consisted of 120 adults from the United States (62 male, 54 female, 4 unidentified; $M_{age} = 35.71$, $SD = 13.1110$; 4 Asian, 8 Black/African American, 7 Hispanic or Latino, 93 White, 5 other, 3 unidentified). They were recruited through MTurk and they completed this study online in exchange for $0.50. Seven other participants were excluded for failure on a simple attention check item (See procedure).

Procedure. Participants were invited to complete an online questionnaire examining their opinions and judgments of employee profiles. After completing a consent form, participants were presented with the profiles of two sales representatives in a

company that sells electric heating systems to home owners. We expected that this would be a context that most participants have little familiarity with. Participants were told that the two representatives had joined the company at the same time (five years ago). Participants then viewed two graphs displaying the number of electric heating units sold by the employees in each of the past five years (see Appendix G). The graphs indicated that both employees had sold an equal number of units in the past year (final point on the graph: 350 units). One of the employees sold around that number each year since he started working at the company, whereas the other sold only 150 units in his first year and his annual unit sales increased steadily over time. The two profiles were presented side-by-side and the location on the screen (left versus right side) was counterbalanced. The names of the sales representatives were also counterbalanced across participants. Participants in the high ambiguity condition were not given any further information that would assist them with their judgments, whereas participants in the low ambiguity condition were told that the average unit sales for representatives at the company was around 250 units per year. This information indicates that the consistent employee performed above average throughout the years he was employed in the company, whereas the improved employee started below average and improved steadily until his performance eventually surpassed the average. Participants completed the same dependent measures used in Study 3. Specifically, they judged the amount of effort invested by the two employees on a slider bar measure, and rated the employees on a set of traits that are related to effort, warmth, competence, success, and ambition (identical to those used in earlier studies). Participants also rated the positivity of their overall impression of the employees (1 = very negative, 7 = very positive). Participants then read

that the company is offering a promotion opportunity to one of its sales representatives, and that the two employees are the candidates for this promotion. Participants were asked to imagine being part of the selection committee and to rate how deserving each employee would be of the promotion (1 = not at all deserving, 7 = very deserving). They also demonstrated their relative preference by moving a tab on a slider bar (from 0 to 100) with endpoints indicating a definite preference for each candidate and midpoint indicating "no preference". On the following page, participants read a simple attention check question, in which they were asked to select the decision scenario that they were instructed to imagine. Participants had three options to choose from: "selecting one of the employees to receive an award", "selecting one of the employees for a promotion", or "I don't know". They were excluded if they did not answer correctly. Finally, participants reported demographic information.

Results

  Perceived effort. First, we submitted the perceived effort ratings to a 2 (ambiguity: high vs. low) × 2 (profile: improved vs. consistent) mixed ANOVA. Only the interaction effect was significant, $F(1, 84) = 17.44$, $p < .001$. When a reference point was not available (high ambiguity), participants thought that the improved sales representative invested more effort in his job ($M = 82.76$, $SD = 13.53$) compared to the consistent one ($M = 69.20$, $SD = 19.44$), $t(53) = 3.61$, $p = .001$, $d = 0.82$. In contrast, when the reference point was available (low ambiguity condition), participants thought that the improved employee invested *less* effort in the job ($M = 73.16$, $SD = 24.89$) compared to the consistent employee ($M = 86.00$, $SD = 15.92$), $t(31) = -2.46$, $p = .02$, $d = -0.62$. This suggests that, when the average employee performance was provided, participants based

their judgments of effort on how each of the employees performed in relation to this average, rather than relying on improvement as a heuristic for effort.

Trait effort. Similarly, we submitted the index of trait effort (Cronbach's $\alpha = .94$ for the consistent profile and .96 for the improved profile) to a 2 (ambiguity: high vs. low) $\times$ 2 (profile: improved vs. consistent) mixed ANOVA. There was a significant main effect of ambiguity ($F[1, 86] = 7.74$, $p = .01$) whereby participants' ratings of trait effort were higher in the low ambiguity condition ($M = 6.01$, $SD = 0.14$) than in the high ambiguity condition ($M = 5.53$, $SD = 0.10$), $d = 4.14$. More importantly, the interaction effect was significant, $F(1, 86) = 40.70$, $p < .001$. In the highly ambiguous condition, participants rated the improved employee higher on trait effort ($M = 6.20$, $SD = 0.94$) compared to the consistent employee ($M = 4.86$, $SD = 1.37$), $t(55) = 5.87$, $p < .001$, $d = 1.14$. In the low ambiguity condition, participants rated the improved employee lower on trait effort ($M = 5.48$, $SD = 1.37$) compared to the consistent employee ($M = 6.54$, $SD = 0.80$), $t(31) = -3.58$, $p = .001$, $d = 0.95$.

Trait competence. The index of trait competence (Cronbach's $\alpha = .75$ for the consistent profile and .82 for the improved profile) was submitted to a 2 (ambiguity: high vs. low) $\times$ 2 (profile: improved vs. consistent) mixed ANOVA. Only the main effect of ambiguity was significant ($F[1, 86] = 10.57$, $p = .01$) indicating that, overall, judgments of competence were lower in the high ambiguity condition. This effect was not anticipated and it does not speak directly to the main questions of interest in the present research. No other effects were significant (See Tables 5a and 5e for mean ratings and standard deviations for different types of judgment in this study).

Deservingness for promotion. Ratings of deservingness for the promotion were also submitted to a 2 (ambiguity: high vs. low) × 2 (profile: improved vs. consistent) mixed ANOVA. The interaction effect was significant, $F(1, 86) = 11.63$, $p = .001$. In the high ambiguity condition, participants rated the improved employee as *more* deserving of promotion ($M = 5.98$, $SD = 0.98$) than the consistent employee ($M = 5.21$, $SD = 1.45$), $t(55) = 2.84$, $p = .01$, $d = 0.62$. In the low ambiguity condition, however, participants rated the improved employee as *less* deserving of promotion ($M = 5.66$, $SD = 1.45$) than the consistent employee ($M = 6.34$, $SD = 1.00$), $t(31) = -2.25$, $p = .03$, $d = 0.55$. Similarly, a t-test conducted on the preference ratings (recoded so that higher numbers indicate greater preference for the improved profile) revealed a greater preference for the improved profile in the highly ambiguous context ($M = 59.38$, $SD = 32.36$) than in the less ambiguous context ($M = 42.34$, $SD = 30.60$), $t(86) = -2.42$, $p = .02$, $d = 0.55$.

Mediation by perceived effort. We followed the same procedure of testing mediation in within-subjects designs (Judd et al., 2001) as in Study 3. We examined whether effort perceptions drove the deservingness ratings of the profiles in each of the high and low ambiguity contexts. First, we computed difference scores (improved – consistent) for the measures of deservingness and perceived effort. We also computed the sum of the profile ratings (improved + consistent) for the measure of perceived effort. For each of the two context conditions, a regression analysis was then conducted with the difference in deservingness as the outcome variable, the difference in effort perceptions as the predictor, and the sum of the effort ratings as a control variable. The deservingness of the improved profile (relative to the consistent profile) was significantly positively related to perceived effort in both the high ($B = .04$, $t(51) = 4.96$, $p < .001$) and the low (B

= .03, $t(29) = 4.38$, $p < .001$) ambiguity conditions. This indicates that the effect of the profiles (improved vs. consistent) on deservingness was mediated by perceptions of effort in both conditions. Correlations among the different types of judgments in this study are presented in Tables 5b, 5c, and 5d. The mediation by effort perceptions is presented in Table 5f.

Mediation by trait effort. To examine the role of trait judgments in driving deservingness ratings, we followed the same procedure of testing mediation as in Study 3. For each of the context ambiguity conditions, a regression analysis was conducted with the difference in deservingness as the outcome variable and the differences between the two profile judgments on the three trait indices (effort, competence, and warmth) as predictors, controlling for the sums of judgments on each of the three indices (See Table 5g for the detailed findings of this analysis). Importantly, the deservingness of the improved profile (relative to the consistent profile) was significantly positively related to the difference in trait effort judgments in both the high ($B = 0.67$, $t(49) = 5.77$, $p < .001$) and the low ($B = 0.69$, $t(25) = 3.48$, $p < .001$) ambiguity conditions. In other words, judgments of trait effort influenced deservingness ratings, even when the judgments of competence and warmth were controlled for in the analyses.

Study 6: Separate Evaluation Context

Studies 1 to 5 provided converging evidence that evaluators perceive greater effort in profiles that show improvement over time compared to those that show consistent strong performance. Participants appeared to use evidence of improvement as a heuristic indicating great effort investment, and this resulted in a relative devaluation of

the effort that went into consistent strong performance. Moreover, Studies 3 and 5 showed that these effort judgements translate into an overall preference for improvement over consistent high performance (e.g., in promotion decisions). Similar to other heuristic-based judgments, these effects were moderated by ambiguity. Specifically, Study 5 showed that participants used improvement as a heuristic indicating effort when the decision was highly ambiguous, but not when it was disambiguated by providing a meaningful reference point. It is noteworthy that all the studies thus far have compared judgments of improvement and consistency in joint-evaluation contexts; the improved and consistent profiles were presented side-by-side and were evaluated simultaneously. We reasoned that most hiring and recruitment decisions require decision makers to view more than one profile and to evaluate them in a joint manner. In Study 6, we extend our investigation to separate decision contexts, in which the evaluator is only judging one performance record. Study 6 is essentially designed as a between-participants version of Study 5. We test whether the improvement-effort heuristic would be used in a separate decision context, and whether the use of the heuristic would be moderated by ambiguity in this context.

Method

Participants. The final sample consisted of 184 adults from the United States (106 male, 72 female, 6 unidentified; $M_{age} = 36.73$, $SD = 14.16$; 10 Asian, 16 Black/African American, 13 Hispanic or Latino, 136 White, 3 other, 5 unidentified) recruited through MTurk. Participants completed this study online in exchange for $0.50. Nine participants were excluded for failure on a simple attention check.

Procedure. All materials were adapted from those used in Study 5. Participants read about the profile of John Thompson, a sales representative who has been working in a company selling electric heating systems for five years. The profile included a graph depicting the number of electric heating units that John sold each year. Participants were assigned to one of four conditions in a 2(ambiguity: high vs. low) × 2(profile: improved vs. consistent) between-participants experimental design. As in Study 5, the final point on the graph was 350 units, regardless of whether the profile depicted consistency (i.e., selling around 350 units every year) or improvement (i.e., starting at 150 units and working up to 350). Participants in the low ambiguity condition read that the average number of units sold by sales representatives at this company was 250 units per year, whereas those in the high ambiguity condition did not read that information. Participants completed the same dependent measures used in the previous studies. Specifically, they judged how much effort John has invested in the past five years, and they also rated him on traits related to effort, warmth, competence, success, and ambition using the same scales that were employed in earlier studies. They then rated the positivity of their overall impression of John. After that, participants read that John was a candidate for a promotion opportunity in the company, and were asked to imagine being part of the selection committee. Participants rated John's deservingness for the promotion (1 = not at all deserving, 7 = very deserving), and then completed the attention check question used in Study 5 (i.e., selecting the decision scenario they were instructed to imagine). Finally, participants completed demographic questions.

Results

Perceived effort. First, participants' perceptions of the effort invested by the employee were compared in a 2 (ambiguity: high vs. low) × 2 (profile: improved vs. consistent) ANOVA. The main effect of ambiguity was significant, $F(1, 180) = 15.40$, $p < .001$, indicating that effort was perceived to be lower in the high ($M = 74.86$, $SD = 18.62$) than in the low ($M = 84.33$, $SD = 15.22$) ambiguity condition, $d = 0.55$. The main effect of profile was also significant, $F(1, 180) = 23.42$, $p < .001$, indicating that the consistent employee was perceived to have invested less effort ($M = 73.55$, $SD = 20.03$) than the improved employee ($M = 85.38$, $SD = 12.35$), $d = 0.71$. Importantly, the interaction effect was also significant, $F(1, 180) = 18.21$, $p < .001$. In the more ambiguous decision context, the improved employee received higher ratings of perceived effort ($M = 85.76$, $SD = 11.59$) than the consistent employee ($M = 65.02$, $SD = 18.35$), $t(95) = 6.57$, $p < .001$, $d = 1.34$. In the less ambiguous condition, however, ratings of effort for the improved ($M = 84.98$, $SD = 13.21$) and the consistent ($M = 83.67$, $SD = 17.16$) employees were not significantly different, $t(85) = 0.40$, $p = .69$, $d = 0.09$.

Trait effort. Participants' perceptions of the employee's trait effort (Cronbach's α = .96 for the consistent profile and .93 for the improved profile) were compared in a 2 (ambiguity: high vs. low) × 2 (profile: improved vs. consistent) ANOVA. The main effects of ambiguity and of profile were both significant ($F[1, 180] = 19.38$, $p < .001$ and $F[1, 180] = 33.60$, $p < .001$, respectively). Specifically, ratings of trait effort were lower in the more ambiguous context ($M = 5.27$, $SD = 1.39$) than in the less ambiguous context ($M = 6.01$, $SD = 1.06$), $d = 0.59$. Ratings were also lower for the consistent employee ($M = 5.14$, $SD = 1.43$) than for the improved employee ($M = 6.12$, $SD = 0.89$), $d = 0.82$. The ambiguity × profile interaction was also significant, $F(1, 180) = 28.67$, $p < .001$. Under a

high level of ambiguity, trait effort ratings were lower for the consistent employee ($M =$ 4.44, $SD = 0.15$) than for the improved employee ($M = 6.20$, $SD = 0.16$), $t(95) = -7.49$, $p < .001$, $d = 1.52$. With a lower level of ambiguity, however, the consistent ($M = 5.98$, $SD = 0.16$) and the improved ($M = 6.05$, $SD = 0.16$) profiles did not differ significantly on trait effort judgments, $t(85) = -0.05$, $p = .96$, $d = 0.44$.

 Trait competence. We also compared perceptions of trait competence (Cronbach's $\alpha = .94$ for the consistent profile and .81 for the improved profile) in a 2 (ambiguity: high vs. low) $\times$ 2 (profile: improved vs. consistent) ANOVA. Similar to Study 5, the main effect of ambiguity was significant ($F[1, 180] = 5.80$, $p = .017$), indicating that ratings of competence were lower in the more ambiguous context ($M = 5.51$, $SD = 0.98$) than in the less ambiguous context ($M = 5.87$, $SD = 1.01$), $d = 0.36$. This effect does not speak directly to the main questions of interest in the present research. Thus, it will not be discussed further. The main effect of profile was significant in this study ($F[1, 180] = 7.99$, $p = .005$), indicating that ratings of competence were lower for the consistent employee ($M = 5.47$, $SD = 1.10$) than for the improved employee ($M = 5.90$, $SD = 0.86$), $d = 0.43$. The ambiguity $\times$ profile interaction was also significant, $F(1, 180) = 7.58$, $p = .007$. Under a high level of ambiguity, trait competence ratings were lower for the consistent employee ($M = 5.14$, $SD = 1.06$) than for the improved employee ($M = 5.93$, $SD = 0.70$), $t(95) = 4.30$, $p < .001$, $d = 0.86$. In the less ambiguous decision context, trait competence ratings were similar for the consistent ($M = 5.87$, $SD = 1.01$) and the improved ($M = 5.88$, $SD = 0.99$) profiles, $t(85) = 0.05$, $p = .81$, $d = 0.01$. Hence, in this study, the pattern of results for trait competence was similar to that of trait effort. The main effect of profile indicating greater competence ratings for the improved profile

was a surprising finding. It is possible that this finding may be the result of the separate evaluation mode employed in this study. Clearly, further research is needed to better understand this finding. Table 6a shows the mean ratings and standard deviations for different types of judgment in this study and Table 6d shows the mean ratings and standard deviations for the individual items that form the indices of trait effort and trait competence.

Deservingness for promotion. Ratings of deservingness for promotion were compared in a 2 (ambiguity: high vs. low) × 2 (profile: improved vs. consistent) ANOVA. Overall, ratings of deservingness were lower in the high ($M = 5.31$, $SD = 1.37$) than in the low ($M = 6.06$, $SD = 0.99$) ambiguity condition, $F(1, 180) = 21.62$, $p < .001$, $d = 0.62$. The consistent employee was viewed as less deserving of promotion ($M = 5.12$, $SD = 1.41$) than the improved employee ($M = 6.23$, $SD = 0.75$), $F(1, 180) = 49.11$, $p < .001$, $d = 0.98$. More importantly, the ambiguity × profile interaction was significant, $F(1, 180) = 22.36$, $p < .001$. In the more ambiguous context, participants viewed the consistent employee to be less deserving of promotion ($M = 4.47$, $SD = 1.24$) than the improved employee ($M = 6.24$, $SD = 0.79$), $t(95) = 8.27$, $p < .001$, $d = 1.68$. In the less ambiguous context, the consistent and the improved profiles were viewed as equally deserving of promotion ($M = 5.88$, $SD = 0.71$ and $M = 6.23$, $SD = 1.20$, respectively), $t(85) = 1.63$, $p = .11$, $d = 0.35$.

Mediation by effort perceptions. We tested a moderated mediation model (Muller, Judd, & Yzerbyt, 2005; Preacher, Rucker, & Hayes, 2007) to examine whether the extent to which the indirect effect of profile on deservingness judgments (as mediated by effort perceptions) was moderated by the ambiguity of the context. We expected

participants to base their decisions on the intuitive improvement-effort association when the decision context was ambiguous, but not when the decision context was disambiguated by providing additional diagnostic information. Hence, we expected the mediation (of profile condition on deservingness judgments) by effort perceptions to be significant in the high ambiguity condition, but not in the low ambiguity condition. We followed the analytical procedure outlined in Preacher et al. (2007). First, effort perceptions were mean-centered and both decision context and profile were effect-coded (low ambiguity = -1, high ambiguity = 1; consistent profile = -1, improved profile = 1). We then examined the moderated mediation model using the SPSS macro designed by Preacher et al. (2007; Model 2). The analyses showed that the ambiguity × profile interaction was a significant predictor of effort perceptions, $B = 4.86$, $t(180) = 4.27$, $p < .001$. When controlling for ambiguity, profile, and their interaction, effort perceptions significantly predicted deservingness judgments, $B = 0.05$, $t(179) = 13.47$, $p < .001$ (See Figure 1 for the overall moderated mediation results). The analysis also included the conditional indirect effect of profile on deservingness (as mediated by effort perceptions) within each of the two ambiguity conditions.

To further understand these conditional effects, we also examined the mediation pattern within each of the ambiguity conditions. In the high ambiguity condition, a bootstrapping analysis with 5,000 samples indicated that the indirect effect was significant (the 95% bias corrected and accelerated CI for the indirect effect was 0.34 to 0.67) suggesting that deservingness judgments were driven by effort perceptions in this condition. Specifically, improvement (vs. consistency) was associated with higher effort perceptions ($B = 10.37$, $t(96) = 6.57$, $p < .001$), which were, in turn, associated with

higher deservingness for promotion (controlling for the effect of improvement; $B = 0.05$, $t(96) = 10.26$, $p < .001$). Figure 2 summarizes the mediation pattern in the high ambiguity condition. As mentioned earlier, the total effect of profile on deservingness was not significant in the low ambiguity condition ($B = .34$, $t(86) = 1.63$, $p = .11$). Likewise, the indirect effect through effort perceptions was not significant (the 95% bias corrected and accelerated CI for the indirect effect was -0.10 to 0.22), indicating that deservingness judgments of the two profiles were not driven by effort perceptions in this condition. Figure 3 shows the results of the mediation analysis in the low ambiguity condition.

We also examined the zero-order correlations among the other types of judgments in this study (e.g., trait ability, trait effort, and trait warmth). Overall, the different types of judgments were positively correlated with one another such that favorable ratings on one aspect were associated with favorable ratings on all the other aspects. We found this pattern of results for the ratings of both the improved and consistent profiles (See Tables 6b and 6c, respectively).

Mediation by trait effort. We also tested whether the indirect effect of profile on deservingness judgments was mediated by trait effort, but only in the highly ambiguous decision context. We used a similar moderated mediation model as that outlined above (based on the guidelines by Preacher et al., 2007), and included other trait judgments (ability and warmth) as covariates in the analyses. The ambiguity $\times$ profile interaction significantly predicted trait effort, $B = 0.22$, $t(178) = 3.80$, $p < .001$, which in turn predicted deservingness judgments, $B = 0.60$, $t(177) = 8.28$, $p < .001$ (controlling for the effects of ambiguity and profile, as well as trait warmth and trait competence; See Figure 4 for the overall moderated mediation results).

To further understand these conditional effects, we also examined the mediation by trait effort within the two ambiguity conditions, controlling for judgments of trait warmth and trait competence. In the high ambiguity context, the indirect effect through trait effort was significant (the 95% bias corrected and accelerated CI for the indirect effect was 0.24 to 0.59), indicating that the difference in trait effort judgments drove the deservingness judgments of the two profiles (See Figure 5). The improved profile received higher ratings of trait effort than the consistent profile ($B = 0.49$, $t(93) = 5.42$, $p < .001$), and this in turn influenced the relative deservingness judgments of the two profiles ($B = 0.76$, $t(92) = 7.32$, $p < .001$). In the low ambiguity condition, the indirect effect through trait effort was not significant (the 95% bias corrected and accelerated CI for the indirect effect was -0.01 to 0.10), indicating that trait effort judgments were not a significant mediator in this condition (See Figure 6). The improved and the consistent profiles were rated similarly on trait effort ($B = 0.06$, $t(83) = 0.75$, $p = .46$). However, when controlling for the effect of profile in this condition, trait effort judgments significantly predicted deservingness judgments ($B = 0.34$, $t(82) = 3.01$, $p < .01$).

In conclusion, Study 6 provides a general replication of our findings in a separate evaluation context. The results indicated that an improved sales representative was judged as more hardworking and was perceived to have invested greater effort than a consistently-strong sales representative, but only when the decision context was considerably ambiguous. When the decision context was disambiguated, the two profiles were rated equally on effort perceptions and trait effort. Consequently, the improved sales representative was viewed as more deserving of the promotion in the high ambiguity condition, but the two profiles were seen as equally deserving in the low

ambiguity condition. A moderated mediation analysis indicated that deservingness judgments were driven by effort perceptions in the high ambiguity condition but not in the low ambiguity condition. Similarly, another analysis indicated that deservingness judgments were driven by trait effort perceptions in the high -but not in the low-ambiguity condition, even when other types of traits (ability and warmth) were controlled for. These findings provide further support to our rationale: In a context that is relatively ambiguous, participants based their deservingness judgments on the intuitive association between improvement and effort, whereas in the less ambiguous context, participants' decisions were influenced by the additional diagnostic information that was provided.

Study 7: Meta-Analyses

The current set of studies provided converging evidence that, in contexts that are considerably ambiguous, evaluators perceive greater effort in profiles that show improvement over time compared to those that show consistent strong performance. These judgments translate into an overall preference for improved profiles in various decision contexts. The findings pertaining to competence judgments were mixed and were less conclusive. In most studies, participants viewed the improved and consistent targets to be equivalent in terms of their competence. However, in some cases (Study 1A; Study 2), the consistent target was viewed as more competent than the improved target. There was also one case (Study 6, high ambiguity condition) in which judgments of competence followed the same pattern as effort judgments, whereby the improved candidate was viewed as more competent than the consistent candidate. In order to understand the effects pertaining to judgments of competence and to assess the overall strength of the effects in the present set of studies, we conducted a series of meta-

analyses. The analyses examined the differences between the improved and consistent

profiles on: (a) effort perceptions, (b) trait effort, (c) trait competence, and (d)

deservingness judgments.

Method

The meta-analyses focused on conditions in which the two profiles were

evaluated in absence of any additional manipulation procedures. Hence, the analyses

included the findings from Studies 1A-1C, the control conditions in Studies 2 and 3, and

the high ambiguity condition in Studies 5 and 6 (i.e., a total of seven samples). First, in

each of the samples, we computed the standardized mean difference between the

improved and the consistent profiles (Cohen's d) on each of: (a) effort perceptions, (b)

trait effort, (c) trait competence, and (d) deservingness judgments (where applicable)

using the program Comprehensive Meta-Analysis (Version 2; Borenstein, Hedges,

Higgins, & Rothstein, 2005). We then used the same program to conduct meta-analyses

using a random effects model. The analyses were based on the effect sizes obtained

(Cohen's d) and the corresponding standard errors. For each of the four dependent

measures outlined above, we first ran the analysis including all seven samples to examine

the overall effects. Then, we re-ran each of the analyses without the sample obtained

from Study 6 (separate evaluation mode) in order to focus more closely on the effects

obtained in joint evaluation contexts.

Results

Perceived effort. The overall effect size for the difference in effort perceptions

between the improved and the consistent profiles was large, Cohen's $d = 0.90$ (95% CI

[0.61, 1.18]), $z = 6.19$, $p < .001$. As expected, effort perceptions were higher for the improved than for the consistent profiles. In studies with a joint evaluation design, the effect size was still large and in the same direction, Cohen's $d = 0.82$ (95% CI [0.53, 1.12]), $z = 5.47$, $p < .001$. Appendix H includes forest plots of the analyses conducted with all seven samples.

Trait effort. Overall, the effect size for the difference between the two profiles on trait effort judgments was large, Cohen's $d = 1.05$ (95% CI [0.85, 1.26]), $z = 10.22$, $p < .001$. Improved profiles were rated higher on trait effort than consistent profiles. In studies with a joint evaluation design, the effect size was still large and in the same direction, Cohen's $d = 0.99$ (95% CI [0.82, 1.16]), $z = 11.41$, $p < .001$.

Trait competence. Overall, the effect size for the difference between the two profiles on trait competence judgments was very small, Cohen's $d = -0.02$ (95% CI [-0.29, 0.24]), $z = -0.18$, $p = .86$. When excluding the sample from Study 6, the effect size remained small, Cohen's $d = -0.14$ (95% CI [-0.36, 0.08]), $z = -1.25$, $p = .21$. This indicated only a slight and non-significant tendency for the consistent profile to be rated higher than the improved profile in terms of competence.

Deservingness. The decision scenarios (including judgments of deservingness for various opportunities) were only presented in Studies 3, 5, and 6. Therefore, the meta-analyses on deservingness judgments only included data from these three samples. The overall effect size for the difference between the profiles on deservingness judgments was large, Cohen's $d = 0.93$ (95% CI [0.24, 1.61]), $z = 2.65$, $p = .01$. However, in studies with

a joint evaluation design, the effect size was moderate, Cohen's $d = 0.57$ (95% CI [0.29,

0.84]), $z = 4.07$, $p < .001$.

General Discussion

In this research project, we proposed that people use improvement as a heuristic

for judging effort, and hence devalue the amount of effort underlying superior

performance profiles that show no evidence of improvement. We tested this proposition

in six empirical studies comparing judgments and preferences of an improved

performance profile versus a consistently-strong performance profile with identical final

performance. We examined profiles of students (Study 1A), software developers (Studies

1B, 2, 3, and 4), course instructors (Study 1C), and sales representatives (Studies 5 and

6). Our studies showed that evaluators perceived greater effort investments in improved

than in consistently-strong performance profiles, particularly when the decision context

was relatively ambiguous. Likewise, those who have improved profiles were viewed as

having a more hardworking character than those with consistent profiles. Consequently,

evaluators thought that individuals with improved profiles were more deserving than ones

with consistent profiles of job promotions (Studies 3, 5, and 6). These patterns of results

were restricted to decision contexts that were relatively ambiguous. Presenting additional

diagnostic information eliminated (Study 6) or even reversed (Study 5) the preference for

the improved candidate over the consistent candidate.

Our studies further demonstrated that highlighting strengths of the consistent

profile was not sufficient to boost perceptions of the effort underlying consistent strong

performance relative to improved performance (Studies 2 and 3). These findings attest to

the robustness of the association between improvement and effort. Some may wonder why the focus on average performance in Study 2 or the unpacking of effort in Study 3 did not attenuate the reliance on improvement as a heuristic, whereas the ambiguity manipulation in Studies 5 and 6 did. It is important to note that in the low ambiguity condition in the latter studies, participants were provided with additional diagnostic information that can override their reliance on the intuitive improvement-effort association (i.e., trigger System 2 reasoning). In contrast, the unpacking manipulation used in Study 3 and the average focus condition in Study 2 did not provide any additional information. Instead, these procedures simply provided participants with opportunities to attend to some of the existing strengths of the consistent profile (e.g., higher cumulative average or higher performance level at the start). The finding that these procedures did not eliminate the reliance on improvement as a heuristic for effort is consistent with research on other heuristics in which incentives to devote full cognitive resources to the judgment at hand did not eliminate the biases caused by the use of heuristics (Gilovich et al., 2002).

Theoretical Implications

As mentioned earlier, most of the research investigating preferences for improvement versus consistency focused on evaluations pertaining to the self. The present research contributes to recent lines of work examining evaluations of intertemporal trends in others (e.g., El Gamal & Buehler, 2014; Pettit et al., 2013). One novel aspect that we introduced is the examination of effort perceptions as a potential mediator for these preferences. Specifically, we show that improvement can enhance perceptions of effort investments, which can in turn drive decision-makers' preferences.

Another novel aspect is the introduction of decision context ambiguity as a potential

moderator of evaluations and decisions concerning improved versus consistent

performance profiles; improved profiles were preferred over consistent profiles, so long

as the decision context was considerably ambiguous.

The current research also contributes to a growing body of literature that

compares and contrasts decisions made under joint versus separate decision modes (for a

review, see Hsee, Loewenstein, Blount, & Bazerman, 1999). According to this literature,

there are some important differences between joint and separate evaluations. Joint

evaluations provide more information to refer to than separate evaluations. Under some

circumstances, joint evaluations can reduce the degree to which intuitive System 1

thinking guides evaluators' overt decisions. Not surprisingly, then, switching from a

separate evaluation mode to a joint evaluation mode can influence preferences, and can

sometimes even lead to preference reversals (e.g., Bohnet, van Greene, & Bazerman,

2012; Hsee et al., 1999). For example, recent research showed that gender biases in hiring

are accentuated in separate evaluation contexts, and can be eliminated when candidate

profiles are evaluated jointly (Bohnet et al., 2012). In that context, participants seem to

have relied more on intuitive System 1 thinking in the separate evaluation mode than in

the joint evaluation mode. Interestingly, however, our research demonstrated the use of

improvement as a heuristic for effort under both joint (Studies 1 to 5) and separate (Study

6) evaluation modes. As mentioned earlier, under both modes of evaluation, participants

rated perceived and trait effort higher in an improved than in a consistently-strong

performance profile, but only when the decision context was highly ambiguous.

Nevertheless, our findings reveal some minor differences across Studies 5 and 6. For

example, introducing the low ambiguity condition simply eliminated the difference in preferences between the improved and consistent profiles in the separate evaluation mode (Study 6), but it lead to a significant reversal in preferences when the profiles were jointly evaluated in Study 5. Moreover, the performance patterns depicted in the two profiles (improved vs. consistent) played a greater role in determining evaluations of competence in Study 6 where the profiles were evaluated separately, but not when the same profiles were jointly evaluated in Study 5. Moreover, the meta-analyses suggested that some of the differences between the two profiles may be stronger in separate than in joint evaluation contexts. Future research can directly manipulate evaluation mode (joint vs. separate) within one experimental study to provide a more systematic examination of the similarities and differences in judgments of effort, competence, and general preferences under the two evaluation modes.

The present research also contributes to our understanding of the nature, antecedents and consequences of effort judgements. Although, traditionally, effort has been conceptualized as a changeable type of attribution, some researchers have acknowledged that, at times, it can also be thought of as a stable trait (Jones, 1989; Weiner et al., 1972). In the current research, we included measures of trait effort (being hardworking, persistent, etc.) as well as measures of perceived state effort (the amount of effort that one has invested in a specific time period). Improvement (vs. consistency) was associated with more favourable evaluations on both types of measures; evaluators thought that improved targets have put in more effort during the work period covered in their performance record and also judged them to be more hardworking. Future research can further explore and identify other contexts in which judgments of the changeable and

stable components of effort would converge (as in the present research), as well as contexts in which they would diverge from one another.

Classic research on attributions (e.g., Heider, 1958; Jones, 1989) also suggests that there is a trade-off between effort and ability. According to that line of research, when performance is held constant, one would expect greater attributions of effort to be associated with lower attributions of ability (and vice versa). In the current set of studies, we assessed perceptions of competence (i.e., ability) as well as effort to examine whether such trade-offs would be applicable. The findings pertaining to ability were mixed. Overall, the meta-analysis suggested that the difference in competence judgments between the improved and the consistent profiles were very small and non-significant. In other words, evaluators inferred higher effort, but not necessarily lower ability, in the improved profile relative to the consistent profile. This is remarkable given that the consistent profile, which was rated lower on effort but was not always rated higher on ability, had always demonstrated superior overall performance than the corresponding improved performance profile. Thus, our studies employed a conservative test of the potential trade-off between effort and ability judgments. The findings suggest that these trade-offs may not be applicable across all contexts.

Practical Implications

The types of judgments and decisions explored in the current research are applicable to real world decisions made in various institutions including companies, universities, etc. In these settings, patterns of performance tend to be tracked and are often made accessible for evaluation purposes, whereas information about effort

investments tends to be less accessible. Hence, a variety of decisions (e.g., hiring, promotions, selecting among candidates for awards, etc.) can be highly susceptible to the biases introduced by a reliance on improvement as a heuristic for effort. The findings of the current studies provide decision-makers, such as managers, coaches, and academics with useful insights that can enable them to make informed decisions when selecting among candidates with varied performance records. Knowing about the tendency to intuitively associate effort with improvement may alert decision-makers to any biases that this association may introduce. This may encourage them to deliberate more carefully about decisions that are susceptible to the influence of these biases and to seek other diagnostic information (over and above records of performance) pertaining to the judgment at hand. Moreover, Studies 5 and 6 suggest that one way of eliminating biases could be providing clear reference points that decision makers can rely on, such as average performance levels within the relevant context. The kinds of judgments examined in the current research are applicable to joint evaluations, where multiple profiles are evaluated at once (e.g., a manager choosing among a set of applicants), and also to separate evaluation modes, where one profile is evaluated on its own (e.g., deciding whether one individual should be promoted or not).

The present research can also provide useful insights to job applicants and students, who seek to present their own records in a favorable manner. It suggests that highlighting areas in which one has improved may lead others to view them as hardworking, and to subsequently choose them for various opportunities. The research also suggests that, in absence of improvement, strong records may still lead to an inference of relatively low effort investments (compared to cases where improvement is

evident). Hence, candidates whose records do not show clear improvement may need to highlight their effort investments and hard work in their profiles. Likewise, reference letter writers may need to highlight information pertaining to hard work and effort when supporting candidates whose records do not show clear evidence of improvement. One caveat, however, is the possibility that an emphasis on effort may activate inferences of lower ability in some contexts. More empirical research is needed to directly examine when and why highlighting effort investments could be an effective strategy, and to understand conditions in which this strategy may backfire.

Directions for Future Research

Our research examined ambiguity as a moderator for the use of improvement as a heuristic for effort. It also included a preliminary investigation of other variables that could potentially play a moderating role in these judgments including gender, ethnic background, lay theories, holistic thinking tendencies, and experience with hiring decisions (See Appendix B). Future research could examine these factors further and determine other factors that may moderate the use of the improvement as a heuristic for judging effort, including individual differences that vary among evaluators as well as features of the judgment task. Some individuals may be more likely to rely on this heuristic than others. For example, people who endorse the view that effort and outcomes are strongly linked (Schrift, Kivetz, & Netzer, 2015) may be more likely to use improvement in performance as an indicator of effort investments. In addition, people may have different lay beliefs and expectations about how performance *should* unfold over the course of one's career; having a greater expectation of improvement could moderate their judgments of improved versus consistent profiles. Cross-cultural

differences may also influence these types of judgments because different cultures tend to

perceive change in different ways (Ji, Nisbett, & Su, 2001). It is also possible that the

strong association between effort and improvement may be a Western notion that does

not apply in other cultural contexts. Another potential moderator that can be explored in

future research is the evaluators' level of expertise. Future research can compare

judgments of effort made by experienced managers/recruiters versus individuals with

lower levels of expertise in hiring and promotion decisions. In the current set of studies,

participants were undergraduate students (who likely had very little experience with these

decisions) as well as adults recruited through MTurk. Some of the participants from

MTurk had some previous experience with hiring and recruitment decisions, but this

experience did not seem to change their pattern of judgments (See Appendix B for more

details). Future research can systematically examine the extent to which reliance on the

heuristic judgments that we found in the current set of studies would be reduced in

individuals who have substantial experience in hiring and recruitment decisions.

Features of the judgment task can also moderate the use of improvement as a

heuristic for effort. For example, the perception of whether or not the targets being

evaluated have room for improvement may present boundary conditions to the patterns of

judgments found in the present research. When there is greater room for improvement,

participants may think that a consistent candidate has the opportunity to improve but is

not working hard enough to attain that improvement. When there is no room for

improvement (e.g., consistently performing at the maximum performance level),

however, participants may not devalue the amount of effort invested by a consistent

performer. In most of the current studies, there was little room for improvement given

that the final performance point (which was controlled across the improved and consistent profiles) was only slightly lower than the maximum point on the scale. In the final studies, sales figures did not include a natural maximum level, making it less clear to judge whether there was room for improvement or not (Studies 5 and 6). Future research can measure or experimentally manipulate perceptions of the possibility of improvement to examine its influence on judgments in a systematic manner.

Researchers can also examine variables that moderate the translation of effort perceptions into favorable judgments. In some contexts, such as judgments of artists, natural talent and ability may be particularly valued over effort. Indeed, research by Tsay and Banaji (2011) shows that participants' decisions among musicians reflected a preference for naturals over strivers. In such contexts, it is possible that evidence of improvement may not be favored over consistency, because effort inferences are not particularly favoured in decisions made in this domain. Similarly, research by Murphy and Dweck (2009) suggests that organizations may have shared cultures that view intelligence as either malleable (incremental theory) or fixed (entity theory). Applicants to organizations that endorse incremental theories of intelligence tend to highlight their motivation, growth, and improvement; and decision-makers in these organizations tend to base their judgments on these factors. In contrast, applicants to organizations that endorse entity theories of intelligence tend to highlight their intellectual abilities and skills; and evaluators tend to base their decisions on these factors (Murphy & Dweck, 2009). It is possible that organizational lay theories may also influence whether perceptions of greater effort investments would translate into favorable judgments by decision-makers in these organizations or not.

Future research could also examine how other intertemporal trends and patterns may influence effort perceptions and subsequent judgments. For example, how would people evaluate a decline in performance over time, compared to the profiles presented in the current research? In contrast to improvement which tends to be associated with high effort investments, any evidence of decline may be associated with perceptions of low effort investments (irrespective of absolute performance level). Hence, it is possible that people would view any decline in performance to reflect very little effort investments, even when compared to other profiles that have lower average performance but no evidence of decline. Exploring this proposition would enable us to examine whether the heuristic judgment explored in the present set of studies is a specific unique association between improvement and effort; or whether it reflects a broader association between effort and performance trends. Future research can also examine how judgments of effort are formed with performance that does not follow a particular linear trend (i.e., random or non-linear changes in performance).

Last but not least, future research could also assess the mental association between effort and improvement at a more basic level, and investigate the degree to which this association tends to be automatically activated based on features of the judgment task. Future research can also explore whether patterns such as consistency and decline are associated with concepts related to low effort (e.g., slacking, laziness). To examine these questions, researchers can use simple methods such as asking participants to generate close associates of the target concepts from memory and examining if concepts related to high exertion of effort would be generated more frequently in response to improvement and whether concepts related to low levels of effort would be

generated more frequently in response to stable or declining performance. They can also employ response time measures such as the Implicit Associations Test (Greenwald, McGhee, & Schwartz, 1998) or investigate whether systematic memory biases would automatically emerge as a result of the supposed conceptual associations. For example, would participants be more likely to erroneously think that they were exposed to direct mentions of effort after reading about improved (vs. consistent or declining) performance? Exploring these questions would enhance our understanding of the association between effort and improvement, and enable us to identify contexts in which it can bias overt judgments.

Concluding Remarks

People rely on mental shortcuts frequently and ubiquitously. Using improvement to judge effort is one appealing heuristic that people may employ in a variety of performance-related domains. One potential downside of relying on this heuristic is devaluing the amount of effort invested by strong performers if they show no evidence of improvement. Understanding when and why this heuristic is employed provides valuable insights that can help managers, academics, and coaches in making well-informed decisions.

Endnotes

[1] In each study, we included additional measures that are beyond the scope of this thesis research. Studies 1A, 1B, 1C, and 2 were exploratory studies, in which some additional measures were presented *before* the measures reported in the present thesis research. These additional measures examined participants' evaluation of the targets' performance, future potential, and overall preferences in specific scenarios. It is possible that the presentation of these measures may have influenced participants' judgments of the variables that we are interested in. However, it is noteworthy that the basic effect reported in Studies 1A, 1B, and 1C (i.e., perceptions of greater effort in an improved versus consistently strong profile) is a robust effect that has been replicated several times across a variety of contexts. In the rest of the studies (Studies 3, 4, 5, and 6), the measures reported in the present thesis research (effort perceptions, trait effort, trait warmth, trait competence, success, ambition, positivity of impression, and overall preferences in scenarios) were presented at the beginning of the experimental session before any additional measures were presented.

[2] At the end of each study, we included a set of individual difference scales. For example, some studies included the analysis-holism scale (Choi, Koo, & Choi, 2007) and/or measures of lay theories of changeability in personality and intelligence (Dweck & Leggett, 1988). We examined whether these variables moderated the main findings of the current studies. We also explored other potential moderators, such as gender and ethnic background. The results of these analyses are summarized in Appendix B.

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Table 1a

Evaluations of Improved and Consistent Profiles in Study 1

				Improved	Consistent	
Study	Student	Perceived effort	*M*	6.22	5.81	*p* = .05
1A	Profiles		*SD*	0.97	1.21	
			N	72	72	
		Trait effort	*M*	6.44	5.96	*p* = .001
			SD	0.64	0.88	
			N	73	73	
		Trait competence	*M*	6.09	6.47	*p* = .001
			SD	0.82	0.66	
			N	73	73	
		Trait warmth	*M*	5.60	5.15	*p* = .01
			SD	0.85	1.14	
			N	73	73	
		Positivity of impression	*M*	6.06	6.85	*p* = .15
			SD	0.92	0.97	
			N	72	72	
Study	Employee	Perceived effort	*M*	6.26	5.20	*p* < .001
1B	Profiles		*SD*	0.91	1.12	
			N	76	76	
		Trait effort	*M*	6.32	5.23	*p* < .001
			SD	0.85	1.13	
			N	77	77	

		Trait competence	*M*	6.07	5.98	*p* = .35
			SD	0.92	0.92	
			N	77	77	
		Trait warmth	*M*	5.30	5.03	*p* < .01
			SD	1.10	0.95	
			N	77	77	
		Positivity of impression	*M*	5.94	5.42	*p* < .001
			SD	1.08	1.13	
			N	77	77	
Study	Instructor	Perceived effort	*M*	6.13	4.81	*p* < .001
1C	Profiles		*SD*	0.88	1.17	
			N	104	104	
		Trait effort	*M*	6.21	5.17	*p* < .001
			SD	0.77	1.02	
			N	103	103	
		Trait competence	*M*	5.89	5.88	*p* = .90
			SD	0.86	0.88	
			N	103	103	
		Trait warmth	*M*	5.32	5.45	*p* = .19
			SD	0.91	0.81	
			N	103	103	
		Positivity of impression	*M*	5.39	5.55	*p* = .24
			SD	1.14	1.06	
			N	103	103	

Table 1b

Correlations among Judgments in Study 1

	Study 1A: Student Profiles					Study 1B: Employee Profiles					Study 1C: Rate My Professor				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Perceived effort (1)		.70***	.49***	-.22†	.20†		.63***	.30**	.37**	.48***		.62***	.48***	.32**	.44***
Trait effort (2)			.42***	-.22†	.14			.27*	.19†	.58***			.53***	.26**	.38***
Trait competence (3)				-.27*	.13				.29*	.45***				.53***	.63***
Trait warmth (4)					.48***					.13					.72***
Positivity of impression (5)															

Note. The correlations reported here were computed with difference scores (improved –consistent) for each type of judgment. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1c

Correlations among Judgments for Each of the Improved Profiles in Study 1

	Study 1A: Student Profiles					Study 1B: Employee Profiles					Study 1C: Rate My Professor				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Perceived effort (1)		.61***	.39**	.11	.34**		.76***	.67***	.51***	.54***		.57***	.45***	.43***	.41***
Trait effort (2)			.56***	.14	.38**			.75***	.48***	.72***			.64***	.52***	.47***
Trait competence (3)				.22†	.51***				.51***	.73***				.54***	.50***
Trait warmth (4)					.47***					.47***					.73***
Positivity of impression (5)															

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1d

Correlations among Judgments for Each of the Consistent Profiles in Study 1

	Study 1A: Student Profiles					Study 1B: Employee Profiles					Study 1C: Rate My Professor				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Perceived effort (1)		.63***	.35**	-.12	.21†		.63***	.44***	.27*	.47***		.60***	.48***	.52***	.45***
Trait effort (2)			.40***	.08	.29*			.59***	.53***	.65***			.64***	.55***	.59***
Trait competence (3)				.27*	.20†				.41***	.65***				.64***	.59***
Trait warmth (4)					.60***					.49***					.65***
Positivity of impression (5)															

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1e

Trait Judgments of Improved and Consistent Profiles in Study 1

				Improved	Consistent	
Study 1A	Student	Hardworking	M	6.51	6.00	*p* < .01
	Profiles		SD	0.77	1.05	
			N	73	73	
		Motivated	M	6.64	5.88	*p* < .001
			SD	0.65	1.08	
			N	73	73	
		Persistent	M	6.01	6.10	*p* = .73
			SD	1.31	1.24	
			N	72	72	
		Determined	M	6.59	5.89	*p* < .001
			SD	0.81	0.95	
			N	73	73	
		Competent	M	6.24	6.43	*p* = .08
			SD	1.00	0.87	
			N	72	72	
		Intelligent	M	6.00	6.54	*p* < .001
			SD	0.92	0.65	
			N	72	72	
		Smart	M	6.01	6.44	*p* < .001
			SD	1.06	0.93	
			N	73	73	

		Trait effort	*M*	6.44	5.96	*p* = .001
			SD	0.64	0.88	
			N	73	73	
		Trait competence	*M*	6.09	6.47	*p* = .001
			SD	0.82	0.66	
			N	73	73	
		Successful	*M*	6.48	6.49	*p* = .88
			SD	0.78	0.72	
			N	69	69	
		Ambitious	*M*	6.49	5.60	*p* < .001
			SD	0.80	1.32	
			N	72	72	
Study 1B	Employee Profiles	Hardworking	*M*	6.36	5.57	*p* < .001
			SD	0.97	1.08	
			N	75	75	
		Motivated	*M*	6.36	4.87	*p* < .001
			SD	0.95	1.29	
			N	76	76	
		Persistent	*M*	6.23	5.30	*p* < .001
			SD	0.90	1.34	
			N	77	77	
		Determined	*M*	6.32	5.19	*p* < .001
			SD	0.99	1.27	
			N	77	77	
		Competent	*M*	6.08	6.05	*p* = .83

			SD	1.03	1.00
			N	74	74
		Intelligent	*M*	6.09	5.97	*p* = .23
			SD	0.93	1.01
			N	76	76
		Smart	*M*	6.08	5.97	*p* = .23
			SD	0.99	0.95
			N	74	74
		Trait effort	*M*	6.32	5.23	*p* < .001
			SD	0.85	1.13
			N	77	77
		Trait competence	*M*	6.07	5.98	*p* = .35
			SD	0.92	0.92
			N	77	77
		Successful	*M*	6.05	5.82	*p* = .03
			SD	1.11	1.07
			N	77	77
		Ambitious	*M*	6.47	4.87	*p* < .001
			SD	0.79	1.27
			N	76	76
Study 1C	Instructor Profiles	Hardworking	*M*	6.40	5.31	*p* < .001
			SD	0.80	1.17
			N	102	102
		Motivated	*M*	6.32	5.02	*p* < .001
			SD	0.89	1.11

	N	102	102	
Persistent	*M*	5.88	5.26	*p* < .001
	SD	1.09	1.23	
	N	102	102	
Determined	*M*	6.25	5.10	*p* < .001
	SD	0.85	1.15	
	N	102	102	
Competent	*M*	5.91	5.85	*p* = .55
	SD	0.93	1.03	
	N	103	103	
Intelligent	*M*	5.89	6.01	*p* = .16
	SD	0.92	0.84	
	N	102	102	
Smart	*M*	5.91	5.80	*p* = .21
	SD	1.13	1.14	
	N	102	102	
Trait effort	*M*	6.21	5.17	*p* < .001
	SD	0.77	1.02	
	N	103	103	
Trait competence	*M*	5.89	5.88	*p* = .90
	SD	0.86	0.88	
	N	103	103	
Successful	*M*	5.92	5.82	*p* = .29
	SD	1.08	1.09	
	N	103	103	

Ambitious	*M*	6.20	4.88	*p* < .001
	SD	0.90	1.09	
	N	103	103	

Note. The index of trait effort is computed as the average of four items (hardworking, motivated, persistent, and determined). The index of trait competence is computed as the average of three items (competent, intelligent, and smart).

Table 2a

Evaluations of Improved and Consistent Profiles in Study 2

			Improved	Consistent	
Average Focus	Perceived effort	*M*	6.04	5.29	*p* = .05
		SD	1.26	1.15	
		N	28	28	
	Trait effort	*M*	6.23	5.48	*p* < .01
		SD	0.85	0.93	
		N	28	28	
	Trait competence	*M*	5.62	6.04	*p* = .03
		SD	0.90	0.69	
		N	28	28	
	Trait warmth	*M*	5.34	5.32	*p* = .91
		SD	0.91	0.93	
		N	28	28	
	Positivity of impression	*M*	5.71	5.79	*p* = .81
		SD	1.15	1.07	
		N	28	28	
Trend Focus	Perceived effort	*M*	5.90	5.00	*p* = .01
		SD	1.32	1.26	
		N	40	40	
	Trait effort	*M*	6.14	5.07	*p* = .001
		SD	1.08	1.15	
		N	39	39	
	Trait competence	*M*	5.59	6.04	*p* = .02

		SD	1.06	0.76	
		N	38	38	
	Trait warmth	M	5.31	5.22	p = .67
		SD	0.90	1.07	
		N	39	39	
	Positivity of impression	M	5.82	5.37	p = .05
		SD	0.93	0.97	
		N	38	38	
Control Condition	Perceived effort	M	5.98	5.29	p = .04
		SD	1.22	1.15	
		N	42	42	
	Trait effort	M	6.12	5.40	p = .001
		SD	0.78	0.93	
		N	42	42	
	Trait competence	M	5.56	5.91	p < .01
		SD	0.69	0.62	
		N	42	42	
	Trait warmth	M	5.43	5.25	p = .21
		SD	1.04	0.92	
		N	42	42	
	Positivity of impression	M	5.73	5.67	p = .76
		SD	1.07	0.94	
		N	41	41	

Table 2b

Correlations among Judgments in Study 2

	Average Focus					Trend Focus					Control Condition				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Perceived effort (1)		.49**	.73***	.17	.25		.81***	.62***	.46**	.62***		.70***	.57***	.31†	.39*
Trait effort (2)			.57**	.52**	-.16			.74***	.60***	.48**			.57***	.22	.48**
Trait competence (3)				.45*	.23*				.49**	.47**				.06	.29†
Trait warmth (4)					.28					.52**					.48**
Positivity of impression (5)															

Note. The correlations reported here were computed with difference scores (improved –consistent) for each type of judgment. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2c

Correlations among Judgments of the Improved Profile in Study 2

	Average Focus					Trend Focus					Control Condition				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Perceived effort (1)		.56**	.66***	.42*	.24		.74***	.60***	.40*	.45**		.64***	.44**	.39*	.49**
Trait effort (2)			.68***	.44*	.12			.79***	.53***	.44**			.57***	.42**	.37*
Trait competence (3)				.60**	.48*				.69***	.50**				.29†	.34*
Trait warmth (4)					.47*					.52**					.46**
Positivity of impression (5)															

Note. † *p* < .10, * *p* < .05, ** *p* < .01, *** *p* < .001.

Table 2d

Correlations among Judgments of the Consistent Profile in Study 2

	Average Focus					Trend Focus					Control Condition				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Perceived effort (1)		.50**	.63***	.24	.54**		.64***	.48**	.42**	.59***		.65***	.49**	-.06	.19
Trait effort (2)			.69***	.57*	.46*			.58***	.43**	.62***			.55***	.15	.34*
Trait competence (3)				.49**	.58**				.43**	.49**				.28†	.29†
Trait warmth (4)					.37†					.57***					.60***
Positivity of impression (5)															

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2e

Trait Judgments of Improved and Consistent Profiles in Study 2

			Improved	Consistent	
Average Focus	Hardworking	*M*	6.04	5.70	*p* = .39
		SD	1.37	1.07	
		N	27	27	
	Motivated	*M*	6.38	5.38	*p* = .001
		SD	0.90	1.17	
		N	26	26	
	Persistent	*M*	5.93	5.57	*p* = .25
		SD	1.18	1.29	
		N	28	28	
	Determined	*M*	6.50	5.25	*p* < .001
		SD	0.92	1.08	
		N	28	28	
	Competent	*M*	5.64	5.96	*p* = .16
		SD	1.22	0.96	
		N	28	28	
	Intelligent	*M*	5.50	6.11	*p* < .01
		SD	1.07	0.63	
		N	28	28	
	Smart	*M*	5.71	6.04	*p* = .11
		SD	0.90	0.74	
		N	28	28	

	Trait effort*	*M*	6.23	5.48	*p* < .01
		SD	0.85	0.93	
		N	28	28	
	Trait competence*	*M*	5.62	6.04	*p* = .03
		SD	0.90	0.69	
		N	28	28	
	Successful	*M*	5.89	6.04	*p* = .54
		SD	0.88	0.84	
		N	28	28	
	Ambitious	*M*	6.39	5.14	*p* < .01
		SD	1.17	1.33	
		N	28	28	
Trend Focus	Hardworking	*M*	6.28	5.36	*p* = .01
		SD	1.15	1.40	
		N	39	39	
	Motivated	*M*	6.26	4.79	*p* = .001
		SD	1.14	1.44	
		N	39	39	
	Persistent	*M*	5.84	5.26	*p* = .08
		SD	1.35	1.25	
		N	38	38	
	Determined	*M*	6.18	4.87	*p* < .001
		SD	1.10	1.36	
		N	39	39	
	Competent	*M*	5.71	6.24	*p* = .05

		SD	1.33	0.97	
		N	38	38	
	Intelligent	M	5.47	5.92	p = .04
		SD	1.08	0.85	
		N	38	38	
	Smart	M	5.58	5.95	p = .06
		SD	1.06	0.84	
		N	38	38	
	Trait effort*	M	6.14	5.07	p = .001
		SD	1.08	1.15	
		N	39	39	
	Trait competence*	M	5.59	6.04	p = .02
		SD	1.06	0.76	
		N	38	38	
	Successful	M	5.84	5.68	p = .53
		SD	1.13	1.04	
		N	38	38	
	Ambitious	M	6.31	4.69	p < .001
		SD	1.24	1.40	
		N	39	39	
Control Condition	Hardworking	M	6.20	5.65	p = .05
		SD	1.14	1.00	
		N	40	40	
	Motivated	M	6.36	5.00	p = .001
		SD	0.73	1.29	

	N	42	42	
Persistent	*M*	5.71	5.62	*p* = .71
	SD	1.17	1.06	
	N	42	42	
Determined	*M*	6.24	5.32	*p* < .001
	SD	0.89	1.11	
	N	41	41	
Competent	*M*	5.76	5.76	*p* = 1.00
	SD	0.88	0.91	
	N	42	42	
Intelligent	*M*	5.40	6.05	*p* < .001
	SD	0.73	0.70	
	N	42	42	
Smart	*M*	5.50	5.93	*p* < .01
	SD	0.89	0.78	
	N	42	42	
Trait effort*	*M*	6.12	5.40	*p* = .001
	SD	0.78	0.93	
	N	42	42	
Trait competence*	*M*	5.56	5.91	*p* < .01
	SD	0.69	0.62	
	N	42	42	
Successful	*M*	5.74	6.07	*p* = .04
	SD	0.94	0.81	
	N	42	42	

Ambitious	M	6.36	5.02	p < .001
	SD	0.73	1.37	
	N	42	42	

Note. The index of trait effort is computed as the average of four items (hardworking, motivated, persistent, and determined). The index of trait competence is computed as the average of three items (competent, intelligent, and smart).

Table 3a

Evaluations of Improved and Consistent Profiles in Study 3

			Improved	Consistent	
Unpacking condition	Perceived effort	M	80.38	68.70	*p* = .001
		SD	9.96	21.39	
		N	53	53	
	Trait effort	M	6.22	4.61	*p* < .001
		SD	0.77	1.34	
		N	53	53	
	Trait competence	M	5.81	5.84	*p* = .80
		SD	0.77	0.75	
		N	53	53	
	Trait warmth	M	5.34	4.85	*p* = .001
		SD	0.89	1.03	
		N	53	53	
	Positivity of impression	M	5.83	5.12	*p* < .01
		SD	0.96	1.32	
		N	52	52	
	Deservingness	M	5.75	5.04	*p* = .02
		SD	1.05	1.62	
		N	53	53	
Control Condition	Perceived effort	M	81.48	69.52	*p* = .001
		SD	15.18	17.98	
		N	52	52	
	Trait effort	M	6.11	4.94	*p* < .001

	SD	0.93	1.32	
	N	52	52	
Trait competence	M	5.83	5.81	p = .93
	SD	0.93	0.83	
	N	52	52	
Trait warmth	M	5.42	5.09	p = .04
	SD	0.92	0.93	
	N	52	52	
Positivity of impression	M	5.65	5.12	p = .01
	SD	1.08	1.13	
	N	52	52	
Deservingness	M	5.92	5.33	p = .01
	SD	0.96	1.32	
	N	51	51	

Table 3b

Unpacking Effort Judgments (The Unpacking Condition in Study 3)

	Improved	Consistent	p
Effort in 2009	68.45	74.88	$p = .13$
Effort in 2010	69.74	70.09	$p = .92$
Effort in 2011	75.38	72.11	$p = .31$
Effort in 2012	78.13	66.75	$p < .01$
Effort in 2013	83.75	65.00	$p < .001$
Change in effort over the five years*	15.30	-9.89	$p < .001$
Overall effort	80.38	68.70	$p = .001$

* Change in effort over the five years was calculated by subtracting the effort rating that each participant provided for 2009 from the rating for 2013.

Table 3c

Correlations among Judgments in Study 3

	Unpacking						Control					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.78***	.27†	.04	.49***	.63***		.69***	.55***	.33*	.72***	.61***
Trait effort (2)			.22	-.01	.64***	.71***			.60***	.39*	.82***	.68***
Trait competence (3)				.27†	.48***	.55***				.41**	.78***	.56***
Trait warmth (4)					.06	.16					.54***	.26†
Positivity of impression (5)						.65***						.71***
Deservingness (6)												

Note. The correlations reported here were computed with difference scores (improved –consistent) for each type of judgment. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3d

Correlations among Judgments of the Improved Profile in Study 3

	Unpacking						Control					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.58***	.28*	.04	.36**	.47***		.58***	.52***	.37**	.50***	.44**
Trait effort (2)			.43**	.06	.61***	.61***			.72***	.45**	.70***	.72***
Trait competence (3)				.36**	.37**	.36**				.59***	.61***	.48***
Trait warmth (4)					.36**	-.06					.74***	.40**
Positivity of impression (5)						.34*						.54***
Deservingness (6)												

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

Table 3e

Correlations among Judgments of the Consistent Profile in Study 3

	Unpacking						Control					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.72***	.24†	.12	.45**	.50***		.54***	.35*	.12	.52***	.53***
Trait effort (2)			.33*	.40**	.65**	.68***			.42**	.42**	.65***	.64***
Trait competence (3)				.35*	.49***	.46**				.49***	.69***	.49***
Trait warmth (4)					.47**	.37**					.66***	.23
Positivity of impression (5)						-.24†						.54***
Deservingness (6)												

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

Table 3f

Trait Judgments of Improved and Consistent Profiles in Study 3

			Improved	Consistent	
Unpacking condition	Hardworking	*M*	6.21	4.91	*p* < .001
		SD	0.84	1.32	
		N	53	53	
	Motivated	*M*	6.23	4.36	*p* < .001
		SD	0.89	1.59	
		N	53	53	
	Persistent	*M*	6.15	4.70	*p* < .001
		SD	0.84	1.49	
		N	53	53	
	Determined	*M*	6.29	4.50	*p* < .001
		SD	0.85	1.39	
		N	52	52	
	Competent	*M*	5.91	5.83	*p* = .58
		SD	0.93	0.94	
		N	53	53	
	Intelligent	*M*	5.74	5.81	*p* = .63
		SD	0.96	.90	
		N	53	53	
	Smart	*M*	5.77	5.87	*p* = .53
		SD	0.87	0.79	
		N	53	53	

	Trait effort	*M*	6.22	4.61	*p* < .001
		SD	0.77	1.34	
		N	53	53	
	Trait competence	*M*	5.81	5.84	*p* = .80
		SD	0.77	0.75	
		N	53	53	
	Successful	*M*	5.96	5.46	*p* = .01
		SD	0.79	1.09	
		N	52	52	
	Ambitious	*M*	6.19	4.26	*p* < .001
		SD	0.96	1.63	
		N	53	53	
Control condition	Hardworking	*M*	6.21	5.17	*p* < .001
		SD	1.11	1.44	
		N	52	52	
	Motivated	*M*	6.20	4.73	*p* < .001
		SD	0.92	1.54	
		N	51	51	
	Persistent	*M*	5.90	5.10	*p* = .01
		SD	1.24	1.47	
		N	51	51	
	Determined	*M*	6.14	4.88	*p* < .001
		SD	0.95	1.36	
		N	50	50	
	Competent	*M*	5.98	5.92	*p* = .74

	SD	1.02	0.95	
	N	52	52	
Intelligent	M	5.81	5.87	p = .70
	SD	0.93	0.84	
	N	52	52	
Smart	M	5.69	5.65	p = .80
	SD	1.29	1.28	
	N	52	52	
Trait effort	M	6.11	4.94	p < .001
	SD	0.93	1.32	
	N	52	52	
Trait competence	M	5.83	5.81	p = .93
	SD	0.93	0.83	
	N	52	52	
Successful	M	5.87	5.50	p = .06
	SD	0.99	1.08	
	N	52	52	
Ambitious	M	6.18	4.67	p < .001
	SD	0.99	1.47	
	N	51	51	

Note. The index of trait effort is computed as the average of four items (hardworking, motivated, persistent, and determined). The index of trait competence is computed as the average of three items (competent, intelligent, and smart).

Table 3g

Mediation of the Deservingness Judgments by Perceived Effort in Study 3

	Variable	*B*	*SE*	*t*	df	
Unpacking condition	(Constant)	-4.53	2.17	-2.09	50	*p* = .04
	Perceived effort sum	0.03	0.01	2.14	50	*p* = .04
	Perceived effort difference	0.07	0.01	5.89	50	*p* < .001
Control condition	(Constant)	1.33	1.26	1.05	48	*p* = .30
	Perceived effort sum	-0.01	0.01	-1.00	48	*p* = .32
	Perceived effort difference	0.04	0.01	5.12	48	*p* < .001

Table 3h

Mediation of the Deservingness Judgments by Trait Effort in Study 3

	Variable	*B*	*SE*	*t*	df	
Unpacking condition	(Constant)	0.05	2.17	0.03	46	*p* = .98
	Trait effort sum	-0.07	0.20	-0.34	46	*p* = .74
	Trait competence sum	0.01	0.18	0.06	46	*p* = .95
	Trait warmth sum	0.00	0.14	0.00	46	*p* = 1.00
	Trait effort difference	0.76	0.14	5.55	46	*p* < .001
	Trait competence difference	0.96	0.22	4.33	46	*p* < .001
	Trait warmth difference	0.11	0.19	0.58	46	*p* = .56
Control condition	(Constant)	-0.82	1.59	-0.51	44	*p* = .611
	Trait effort sum	0.06	0.15	0.38	44	*p* = .71
	Trait competence sum	-0.16	0.17	-0.98	44	*p* = .33
	Trait warmth sum	0.18	0.14	1.28	44	*p* = .21
	Trait effort difference	0.57	0.14	3.98	44	*p* < .001
	Trait competence difference	0.38	0.22	1.68	44	*p* = .10
	Trait warmth difference	-0.01	0.17	-0.04	44	*p* = .97

Table 4

Effort and Ability Mentions for Supporting the Improved and Consistent Profiles in Study 4

		Profile Supported		
		Improved	Consistent	
		($n = 56$)	($n = 55$)	
Effort mentions	*N*	25	13	
	Percentage within condition	44.6%	23.6%	*p* = .02
Ability mentions	*N*	3	9	
	Percentage within condition	5.4%	16.4%	*p* = .06

Table 5a

Evaluations of Improved and Consistent Profiles in Study 5

Context condition			Improved	Consistent	
High ambiguity	Perceived effort	M	82.76	69.20	p = .001
(no average)		SD	13.53	19.44	
		N	54	54	
	Trait effort	M	6.20	4.86	p < .001
		SD	0.94	1.37	
		N	56	56	
	Trait competence	M	5.56	5.58	p = .91
		SD	0.92	0.94	
		N	56	56	
	Trait warmth	M	5.45	5.31	p = .40
		SD	0.95	1.04	
		N	56	56	
	Positivity of impression	M	5.75	5.27	p = .03
		SD	1.01	1.17	
		N	56	56	
	Deservingness	M	5.98	5.21	p = .01
		SD	0.98	1.45	
		N	56	56	
Low ambiguity	Perceived effort	M	73.16	86.00	p = .03
(average presented)		SD	24.89	15.92	
		N	33	33	
	Trait effort	M	5.48	6.54	p = .001

	SD	1.37	0.80	
	N	32	32	
Trait competence	M	6.21	6.03	p = .22
	SD	0.92	0.91	
	N	32	32	
Trait warmth	M	5.80	5.95	p = .47
	SD	1.04	1.09	
	N	32	32	
Positivity of impression	M	5.78	6.22	p = .08
	SD	1.18	1.07	
	N	32	32	
Deservingness	M	5.66	6.34	p = .02
	SD	1.45	1.00	
	N	33	33	

Table 5b

Correlations among Judgments in Study 5

	High ambiguity						Low ambiguity					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.65***	.59***	.33*	.54***	.62***		.68***	.47**	.57**	.56**	.71***
Trait effort (2)			.67***	.58***	.77***	.84***			.55***	.59***	.64***	.76***
Trait competence (3)				.68***	.76***	.74***				.77***	.67***	.56**
Trait warmth (4)					.78***	.68***					.78***	.56**
Positivity of impression (5)						.77***						.71***
Deservingness (6)												

Note. The correlations reported here were computed with difference scores (improved –consistent) for each type of judgment. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5c

Correlations among Judgments of the Improved Profile in Study 5

	High ambiguity						Low ambiguity					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.54***	.45**	.28*	.39**	.43**		.83***	.41*	.43*	.63***	.81***
Trait effort (2)			.62***	.60***	.62***	.64***			.47**	.40*	.67***	.78***
Trait competence (3)				.67***	.70***	.49***				.68***	.64***	.48**
Trait warmth (4)					.79***	.52***					.52**	.37*
Positivity of impression (5)						.53***						.63***
Deservingness (6)												

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

Table 5d

Correlations among Judgments of the Consistent Profile in Study 5

	High ambiguity						Low ambiguity					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.62***	.59***	.46***	.63***	.66***		.49***	.28	.51**	.36*	.40*
Trait effort (2)			.66***	.73***	.81***	.80***			.54**	.68***	.46**	.66***
Trait competence (3)				.65***	.69***	.59***				.71***	.72***	.52**
Trait warmth (4)					.82***	.69***					.75***	.54***
Positivity of impression (5)						.78***						.65***
Deservingness (6)												

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

Table 5e

Trait Judgments of Improved and Consistent Profiles in Study 5

			Improved	Consistent	
High ambiguity	Hardworking	*M*	6.29	5.13	*p* < .001
(no average)		*SD*	0.95	1.42	
		N	56	56	
	Motivated	*M*	6.25	4.56	*p* < .001
		SD	1.00	1.52	
		N	55	55	
	Persistent	*M*	6.18	4.87	*p* < .001
		SD	1.16	1.50	
		N	55	55	
	Determined	*M*	6.09	4.84	*p* < .001
		SD	1.10	1.46	
		N	56	56	
	Competent	*M*	5.84	5.78	*p* = .80
		SD	0.94	1.20	
		N	55	55	
	Intelligent	*M*	5.50	5.63	*p* = .43
		SD	0.97	0.95	
		N	56	56	
	Smart	*M*	5.32	5.32	*p* = 1.00
		SD	1.39	1.35	
		N	56	56	

	Trait effort	*M*	6.20	4.86	*p* < .001
		SD	0.94	1.37	
		N	56	56	
	Trait competence	*M*	5.56	5.58	*p* = .91
		SD	0.92	0.94	
		N	56	56	
	Successful	*M*	5.84	5.59	*p* = .25
		SD	0.97	1.26	
		N	56	56	
	Ambitious	*M*	6.18	4.48	*p* < .001
		SD	1.01	1.73	
		N	56	56	
Low ambiguity	Hardworking	*M*	5.68	6.45	*p* = .02
(average presented)		*SD*	1.42	1.03	
		N	31	31	
	Motivated	*M*	5.06	6.58	*p* < .001
		SD	1.57	0.72	
		N	31	31	
	Persistent	*M*	5.73	6.57	*p* = .01
		SD	1.26	0.86	
		N	30	30	
	Determined	*M*	5.33	6.50	*p* < .01
		SD	1.56	0.86	
		N	30	30	
	Competent	*M*	6.34	6.22	*p* = .54

	SD	0.97	0.91	
	N	32	32	
Intelligent	M	6.13	6.00	p = .46
	SD	1.01	1.02	
	N	32	32	
Smart	M	6.16	5.88	p = .13
	SD	1.14	1.36	
	N	32	32	
Trait effort	M	5.48	6.54	p = .001
	SD	1.37	0.80	
	N	32	32	
Trait competence	M	6.21	6.03	p = .22
	SD	0.92	0.91	
	N	32	32	
Successful	M	6.17	6.03	p = .59
	SD	1.18	1.10	
	N	30	30	
Ambitious	M	5.03	6.47	p < .001
	SD	1.67	1.08	
	N	32	32	

Note. The index of trait effort is computed as the average of four items (hardworking, motivated, persistent, and determined). The index of trait competence is computed as the average of three items (competent, intelligent, and smart).

Table 5f

Mediation of the Deservingness Judgments by Perceived Effort in Study 5

	Variable	*B*	*SE*	*t*	df	
High ambiguity	(Constant)	2.08	1.98	1.05	51	*p* = .30
(no average)	Perceived effort sum	-0.01	0.01	-0.97	51	*p* = .34
	Perceived effort difference	0.04	0.01	4.96	51	*p* < .001
Low ambiguity	(Constant)	-3.22	1.29	-2.50	29	*p* = .02
(average presented)	Perceived effort sum	0.02	0.01	2.42	29	*p* = .02
	Perceived effort difference	0.03	0.01	4.38	29	*p* < .001

Table 5g

Mediation of the Deservingness Judgments by Trait Effort in Study 5

	Variable	*B*	*SE*	*t*	df	
High ambiguity	(Constant)	0.12	1.21	0.10	49	*p* = .93
(no average)	Trait effort sum	-0.02	0.15	-0.02	49	*p* = .89
	Trait competence sum	-0.01	0.13	-0.01	49	*p* = .94
	Trait warmth sum	0.00	0.15	0.00	49	*p* = .98
	Trait effort difference	0.67	0.12	0.57	49	*p* < .001
	Trait competence difference	0.40	0.18	0.23	49	*p* = .03
	Trait warmth difference	0.32	0.16	0.19	49	*p* = .05
Low ambiguity	(Constant)	-1.48	2.18	-0.68	25	*p* = .50
(average presented)	Trait effort sum	-0.01	0.22	-0.03	25	*p* = .97
	Trait competence sum	-0.04	0.18	-0.21	25	*p* = .83
	Trait warmth sum	0.17	0.19	0.91	25	*p* = .37
	Trait effort difference	0.69	0.20	3.48	25	*p* < .01
	Trait competence difference	0.46	0.43	1.08	25	*p* = .29
	Trait warmth difference	0.02	0.30	0.05	25	*p* = .96

Table 6a

Evaluations of Improved and Consistent Profiles in Study 6

Context condition			Improved	Consistent	
High ambiguity	Perceived effort	*M*	85.76	65.02	*p* <.001
(no average)		*SD*	11.59	18.35	
		N	46	51	
	Trait effort	*M*	6.20	4.52	*p* <.001
		SD	0.83	1.30	
		N	46	51	
	Trait competence	*M*	5.93	5.14	*p* <.001
		SD	0.70	1.06	
		N	46	51	
	Trait warmth	*M*	5.66	4.87	*p* <.001
		SD	0.87	0.97	
		N	46	51	
	Positivity of impression	*M*	5.87	4.92	*p* <.001
		SD	0.98	1.02	
		N	46	51	
	Deservingness	*M*	6.24	4.47	*p* <.001
		SD	0.79	1.24	
		N	46	51	
Low ambiguity	Perceived effort	*M*	84.98	83.67	*p* = .69
(average presented)		*SD*	13.21	17.16	
		N	44	43	
	Trait effort	*M*	6.03	6.02	*p* = .96

	SD	0.99	1.16	
	N	44	43	
Trait competence	*M*	5.88	5.87	*p* = .96
	SD	1.01	1.02	
	N	44	43	
Trait warmth	*M*	5.41	5.85	*p* = .07
	SD	1.22	1.00	
	N	44	43	
Positivity of impression	*M*	6.05	5.79	*p* = .25
	SD	0.96	1.08	
	N	44	43	
Deservingness	*M*	6.23	5.88	*p* = .11
	SD	0.71	1.20	
	N	44	43	

Table 6b

Correlations among Judgments of the Improved Profile in Study 6

	High ambiguity						Low ambiguity					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.73***	.60***	.54***	.55***	.73***		.49**	.44**	.28†	.53***	.60***
Trait effort (2)			.76***	.65***	.54***	.75***			.74***	.63***	.71***	.61***
Trait competence (3)				.66***	.61***	.54***				.74***	.66***	.64***
Trait warmth (4)					.62***	.48**					.70***	.50**
Positivity of impression (5)						.50***						.77***
Deservingness (6)												

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

Table 6c

Correlations among Judgments of the Consistent Profile in Study 6

	High ambiguity						Low ambiguity					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Perceived effort (1)		.78***	.59***	.49***	.72***	.73***		.90***	.81***	.77***	.77***	.74***
Trait effort (2)			.64***	.60***	.71***	.74***			.80***	.78***	.77***	.72***
Trait competence (3)				.80***	.61***	.42**				.78***	.81***	.72***
Trait warmth (4)					.57***	.40**					.74***	.68***
Positivity of impression (5)						.71***						.64***
Deservingness (6)												

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

Table 6d

Trait Judgments of Improved and Consistent Profiles in Study 6

			Improved	Consistent	
High ambiguity	Hardworking	*M*	6.22	4.72	*p* < .001
(no average)		*SD*	0.89	1.36	
		N	46	50	
	Motivated	*M*	6.20	4.29	*p* < .001
		SD	0.89	1.30	
		N	46	51	
	Persistent	*M*	6.16	4.55	*p* < .001
		SD	0.93	1.46	
		N	45	51	
	Determined	*M*	6.20	4.55	*p* < .001
		SD	0.93	1.50	
		N	46	51	
	Competent	*M*	6.24	5.24	*p* < .001
		SD	0.79	1.21	
		N	46	51	
	Intelligent	*M*	5.74	5.04	*p* = .001
		SD	0.80	1.15	
		N	46	51	
	Smart	*M*	5.80	5.14	*p* < .001
		SD	0.78	1.09	
		N	46	50	

	Trait effort	*M*	6.20	4.52	*p* <.001
		SD	0.83	1.30	
		N	46	51	
	Trait competence	*M*	5.93	5.14	*p* <.001
		SD	0.70	1.06	
		N	46	51	
	Successful	*M*	6.15	4.90	*p* < .001
		SD	0.82	1.30	
		N	46	51	
	Ambitious	*M*	6.20	4.10	*p* < .001
		SD	0.89	1.36	
		N	46	51	
Low ambiguity	Hardworking	*M*	6.09	6.05	*p* = .87
(average presented)		*SD*	1.20	1.19	
		N	44	42	
	Motivated	*M*	6.02	6.07	*p* = .85
		SD	1.26	1.24	
		N	44	43	
	Persistent	*M*	5.91	5.95	*p* = .85
		SD	1.24	1.17	
		N	44	43	
	Determined	*M*	6.09	6.00	*p* = .70
		SD	0.91	1.23	
		N	44	43	
	Competent	*M*	6.02	6.09	*p* = .79

	SD	1.39	1.07	
	N	44	43	
Intelligent	*M*	5.82	5.70	*p* = .59
	SD	1.04	1.06	
	N	44	43	
Smart	*M*	5.80	5.81	*p* = .94
	SD	1.15	1.08	
	N	44	43	
Trait competence	*M*	5.88	5.87	*p* = .96
	SD	1.01	1.02	
	N	44	43	
Trait warmth	*M*	5.41	5.85	*p* = .07
	SD	1.22	1.00	
	N	44	43	
Successful	*M*	6.05	6.02	*p* = .93
	SD	1.14	1.10	
	N	44	43	
Ambitious	*M*	6.11	5.81	*p* = .22
	SD	1.02	1.22	
	N	44	43	

Note. The index of trait effort is computed as the average of four items (hardworking, motivated, persistent, and determined). The index of trait competence is computed as the average of three items (competent, intelligent, and smart).
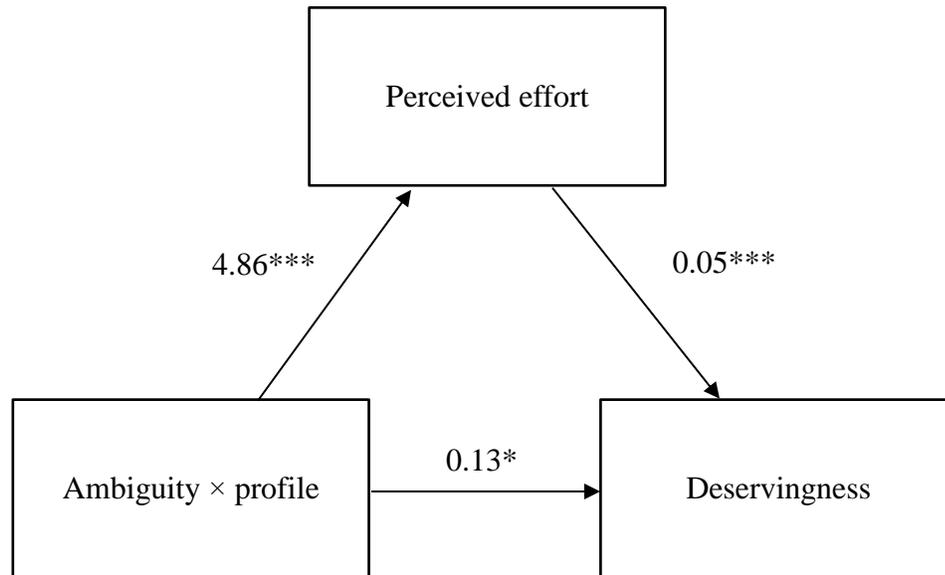
Figure 1. The moderated mediation model examined in Study 6 with perceived effort as

the mediator. The ambiguity (low ambiguity = -1, high ambiguity = 1) × profile

(consistent = -1, improved = 1) interaction was a significant predictor of deservingness, *B*

= 0.36, *t*(180) = 4.73, *p* < .001. Perceived effort mediated the effects of profile on

deservingness judgments, and this mediation was moderated by the ambiguity of the

decision context. The main effects of profile and ambiguity are controlled for in this

analysis. *p < .05, ***p < .001.
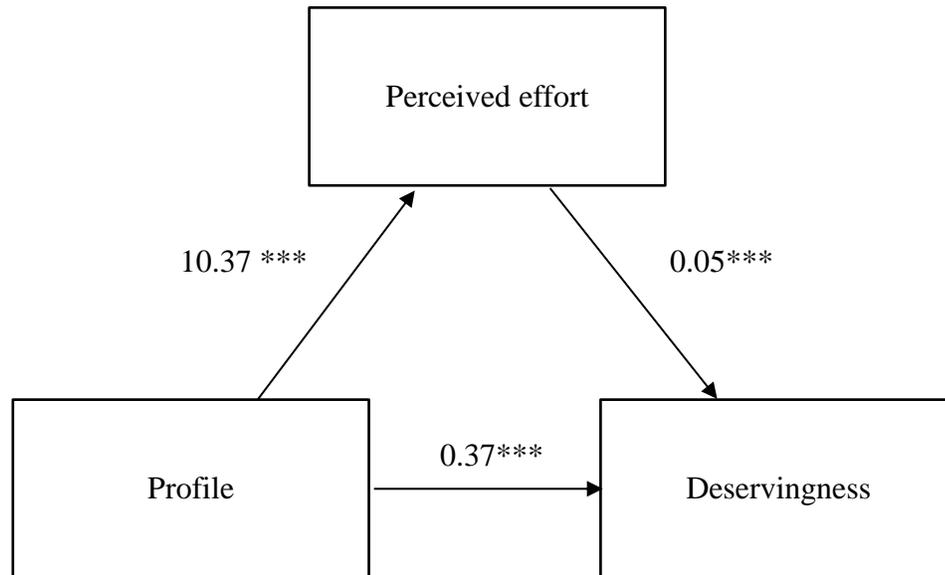
Figure 2. The mediation by perceived effort in the high ambiguity condition in Study 6. The total effect of profile (-1 = consistent profile, 1 = improved profile) on deservingness judgments was significant, $B = 0.88$, $t(96) = 8.27$, $p < .001$. Perceived effort mediated the effect of profile on deservingness judgments in this condition. $***p < .001$.
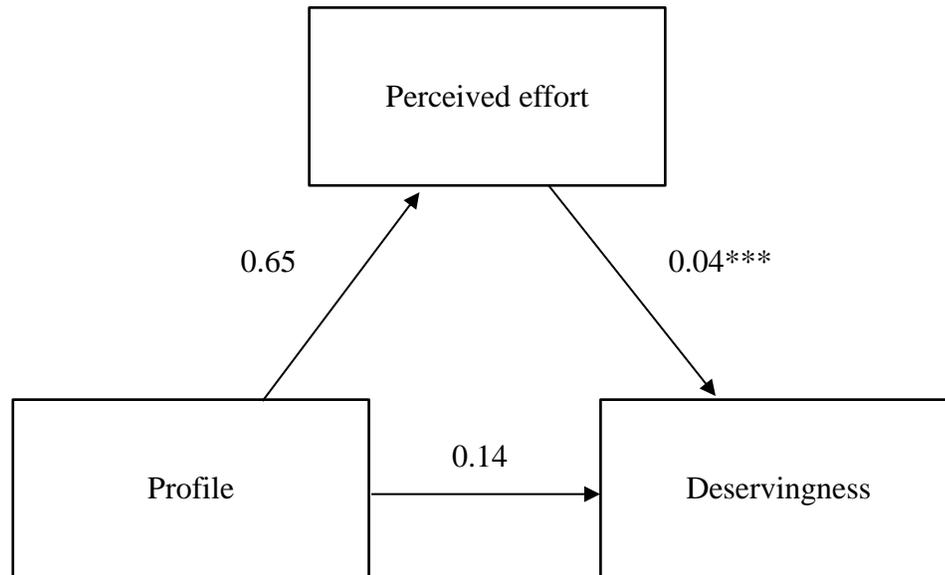
Figure 3. The mediation by perceived effort in the low ambiguity condition in Study 6. The total effect of profile (-1 = consistent profile, 1 = improved profile) on deservingness judgments was not significant, $B = 0.17$, $t(96) = 1.63$, $p = .11$. Perceived effort did not mediate the effect of profile on deservingness judgments in this condition. ***$p < .001$.
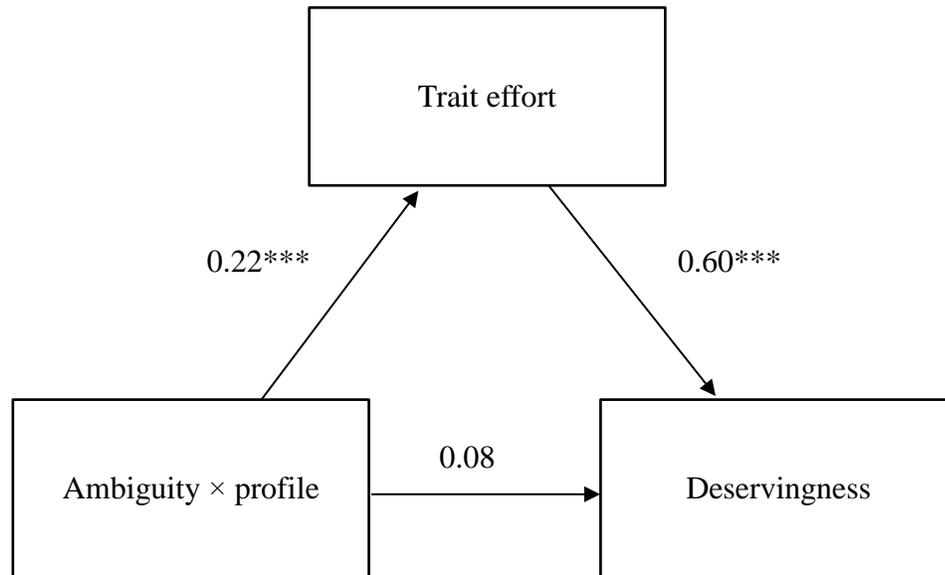
Figure 4. The moderated mediation model examined in Study 6 with trait effort as the mediator. The ambiguity (low ambiguity = -1, high ambiguity = 1) × profile (consistent = -1, improved = 1) interaction was a significant predictor of deservingness, $B = 0.22$, $t(178) = 3.31$, $p = .001$. Trait effort mediated the effects of profile on deservingness judgments, and this mediation was moderated by the ambiguity of the decision context. The main effects of profile and ambiguity, as well as trait competence and trait warmth, were controlled for in this analysis. ***$p < .001$.
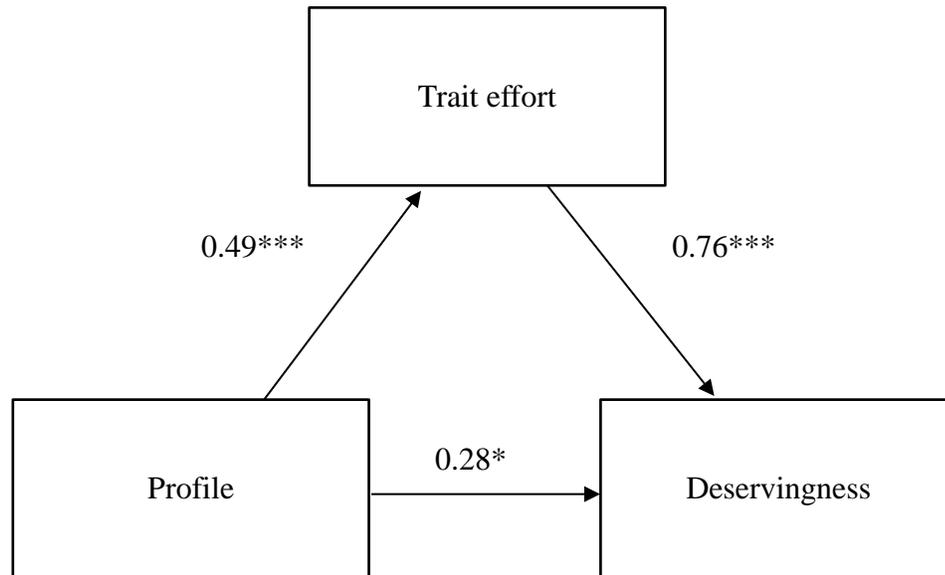
Figure 5. The mediation by trait effort judgments in the high ambiguity condition in

Study 6. The total effect of profile (-1 = consistent profile, 1 = improved profile) on

deservingness judgments was significant, $B = 0.66$, $t(96) = 6.24$, $p < .001$. Effort

perceptions mediated the effect of profile on deservingness judgments in this condition.

Trait competence and trait warmth were controlled for in this analysis. *$p < .05$, ***$p <$

.001.

Figure 6. The mediation by trait effort judgments in the low ambiguity condition in Study

6. The total effect of profile (-1 = consistent profile, 1 = improved profile) on

deservingness judgments was significant, $B = 0.19$, $t(96) = 2.36$, $p = .03$. Trait effort did

not mediate the effect of profile on deservingness judgments in this condition. Trait

competence and trait warmth were controlled for in this analysis.   * $p < .05$,** $p < .01$.

Appendix A

Student Profiles (Study 1A)

> Kristen is a third-year undergraduate student studying psychology. She is a member of the "Psych Society". In her leisure time, Kristen likes to listen to music and to play sports.

> Sarah is a third-year biology student. She is a member of the Faculty of Science Student Association. In her leisure time, Sarah enjoys painting and watching movies.

Kristen's GPA

Sarah's GPA

Please read the following question carefully and select the number that best represents *your own opinion* about each of the students:

How much effort do you think **Kristen** spent studying for her university courses?							How much effort do you think **Sarah** spent studying for her university courses?						
No effort at all 1	2	3	4	5	6	A lot of effort 7	No effort at all 1	2	3	4	5	6	A lot of effort 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

Now, we are interested in the general impression that you have formed about Kristen and Sarah, based on the short profiles that you read. Each of the following items includes an opposite pair of characteristics that we can use to describe other people. Please read each pair and select the number that best represents where you think each of the two students stands in terms of these characteristics.

I think that Kristen is ...							I think that Sarah is ...						
Not intelligent 1	2	3	4	5	6	Intelligent 7	Not intelligent 1	2	3	4	5	6	Intelligent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that Kristen is ...							I think that Sarah is ...						
Stupid 1	2	3	4	5	6	Smart 7	Stupid 1	2	3	4	5	6	Smart 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …							I think that Sarah is …					
Not competent 1	2	3	4	5	6	Competent 7	Not competent 1	2	3	4	5	6	Competent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …							I think that Sarah is …					
Not successful 1	2	3	4	5	6	Successful 7	Not successful 1	2	3	4	5	6	Successful 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …							I think that Sarah is …					
Not ambitious 1	2	3	4	5	6	Ambitious 7	Not ambitious 1	2	3	4	5	6	Ambitious 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …							I think that Sarah is …					
Lazy 1	2	3	4	5	6	Hardworking 7	Lazy 1	2	3	4	5	6	Hardworking 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …							I think that Sarah is …					
Not motivated 1	2	3	4	5	6	Motivated 7	Not motivated 1	2	3	4	5	6	Motivated 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …							I think that Sarah is …					
Not persistent 1	2	3	4	5	6	Persistent 7	Not persistent 1	2	3	4	5	6	Persistent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that Kristen is …								I think that Sarah is …						
Not determined 1	2	3	4	5	6	Determined 7		Not determined 1	2	3	4	5	6	Determined 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that Kristen is …								I think that Sarah is …						
Shy 1	2	3	4	5	6	Outgoing 7		Shy 1	2	3	4	5	6	Outgoing 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that Kristen is …								I think that Sarah is …						
Not likable 1	2	3	4	5	6	Likable 7		Not Likable 1	2	3	4	5	6	Likable 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that Kristen is …								I think that Sarah is …						
Not friendly 1	2	3	4	5	6	Friendly 7		Not friendly 1	2	3	4	5	6	Friendly 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that Kristen is …								I think that Sarah is …						
Cold 1	2	3	4	5	6	Warm 7		Cold 1	2	3	4	5	6	Warm 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that Kristen is …								I think that Sarah is …						
An introvert 1	2	3	4	5	6	An extrovert 7		An introvert 1	2	3	4	5	6	An extrovert 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Overall, I think that my first impression of Kristen is...							Overall, I think that my first impression of Sarah is...						
Very negative 1	2	3	4	5	6	Very positive 7	Very negative 1	2	3	4	5	6	Very positive 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

Appendix B

Exploring Potential Moderators of Effort and Deservingness Judgments

Gender

In all studies, we examined whether participants' gender influenced effort perceptions and judgments of trait effort for the improved profile relative to the consistent profile. In Studies 1A-1C, gender did not influence any of the effects. In Study 2, the gender × profile interaction was significant for both effort perceptions ($F[1, 98] = 5.30$, $p = .02$) and judgments of trait effort ($F[1, 98] = 8.56$, $p = .004$), indicating that female participants rated the improved employee higher than the consistent employee on both measures (p's < .001), whereas male participants rated both employees equally (p's > .05). Similarly, in Study 3, the gender × profile interaction was significant for both effort perceptions ($F[1, 95] = 4.91$, $p = .03$) and trait effort ($F[1, 95] = 8.10$, $p = .01$). On perceptions of effort, female participants rated the improved employee significantly higher than the consistent employee ($p < .001$), whereas the difference was not significant for male participants ($p = .10$). On trait effort, both male and female participants rated the improved employee significantly higher than the consistent employee (p's < .001), but the difference was greater in ratings provided by female participants. In Study 4, a logistic regression indicated that gender did not influence the degree to which effort was mentioned when supporting the improved profile, relative to the consistent profile. Likewise, in Studies 5 and 6, gender did not influence judgments of effort for the improved profile, relative to the consistent profile.

Ratings of deservingness of the candidates for promotion were examined in Studies 3, 5, and 6 so we also tested whether gender influenced deservingness judgments in these three studies. The relevant interactions involving gender and profile type were not significant (p's > .05).

Overall, the majority of studies did not reveal significant gender × profile interactions with judgments of effort and deservingness. The lack of statistical significance for some of the results obtained by male participants in Studies 2 and 3 could possibly be attributed to the smaller number of male (vs. female) participants in these studies. Perhaps these small numbers did not enable us to reliably detect the differences in judgments of the improved versus consistent profiles among male respondents. Given the bulk of evidence, it appears that gender does not have a reliable influence on the effects found in the present studies.

Ethnic Background

Eastern cultures tend to perceive patterns of change in ways that are different from Western cultures (Ji , Nisbett, & Su, 2001). Although the samples of participants in the present studies were all residents of the United States and Canada, we were interested in comparing the judgments obtained from participants with East Asian versus White ethnic backgrounds. We were only able to examine these comparisons in Studies 1A, 1C, and 2 because in all of the other studies there was at least one condition with fewer than 10 East Asian participants. In Study 1A, the ethnicity × profile interaction was significant with trait effort ($F[1,55] = 3.92$, $p = .05$) but not with effort perceptions ($p > .05$). The relevant contrasts indicated that participants from both ethnic backgrounds perceived the

improved student to be more hardworking than the consistent student (p's < .05), but the difference between the ratings of the two profiles was greater among East Asian participants. In Study 1C and in Study 2, the interactions involving ethnicity and profile type were not significant (p's > .05). Overall, it is difficult to form conclusions about cultural differences in the use of improvement as a heuristic for judging effort based on the limited information in the present studies. Future research is needed to examine potential cross-cultural differences in this domain.

Analysis-Holism

We wanted to examine whether variability in participants' holistic thinking tendencies would influence judgments pertaining to the main variables examined in the present research. In Studies 1-4, participants completed the analysis-holism scale (AHS; Choi, Koo, & Choi, 2007). We computed their overall score on this scale and examined its correlations with the difference scores (improved − consistent) on the main measures in Studies 1A-1C and within each of the conditions in Studies 2 and 3. The only significant correlation was found in the control condition in Study 3 whereby higher AHS scores (i.e., having a higher holistic thinking tendency) were associated with viewing the improved employee to be more hardworking relative to the consistent employee, $r(48) =$ .28, $p = .05$. No other effects were significant. In Study 4, we ran a logistic regression with profile, AHS scores, and their interaction as predictors of effort mentions. The AHS × profile interaction did not predict effort mentions, $p > .05$. Overall, the present research provided very little evidence concerning the potential moderating role of analytical reasoning/holistic thinking tendencies in judging effort.

Lay Theories of Personality

We examined the correlations of lay theories of personality (Dweck & Leggett, 1988) with difference scores (improved – consistent) on the main measures in Studies 1A-1C and within each of the conditions in Studies 2 and 5. In all of these studies, lay theories did not predict judgements of the improved profile relative to the consistent profile on effort perceptions, trait effort, or deservingness (when applicable), p's > .05. We also examined whether lay theories predicted whether effort was mentioned in support of the profiles in Study 4. The lay theories × profile interaction was not significant, p > .05. Likewise, in Study 6, a series of regression analyses indicated that lay theories of personality did not moderate any of the effects found with effort perceptions, trait effort, or deservingness judgments (p's > .05).

Lay Theories of Intelligence

We examined the correlations of lay theories of intelligence (Dweck & Leggett, 1988) with difference scores (improved – consistent) on the main measures within Studies 1B and 1C; and within each of the conditions in Studies 2 and 5. In Studies 1B, 1C, and 5, lay theories were not significantly correlated with the difference scores for effort perceptions, trait effort, or deservingness (when applicable), p's > .05. In the average focus condition in Study 2, however, having a more incremental theory of intelligence was associated with perceptions of lower effort in the improved profile relative to the consistent profile, $r(27) = -.48$, $p = .01$. In contrast, in the trend focus condition in the same study, having a more incremental theory of intelligence was associated with perceptions of higher effort in the improved profile relative to the

consistent profile, $r(39) = .37$, $p = .02$. These results were not anticipated and can potentially be attributed to the manipulation procedure. However, we would hesitate to draw conclusions from these correlations given the small sample sizes within the conditions. A logistic regression in Study 4 showed that the lay theories × profile interaction was not significant in predicting effort mentions, $p > .05$. In Study 6, a series of regression analyses indicated that lay theories of intelligence did not moderate any of the effects found with effort perceptions, trait effort, or deservingness judgments (p's > .05).

Experience with Hiring Decisions

Studies 3, 5, and 6 asked participants to rate the improved and consistent profiles on deservingness of a job promotion. Hence, we thought that experience with hiring and recruitment decisions would be relevant for making these judgments. Participants were asked whether they have any previous experience with such hiring and/or recruitment, and we examined whether this influenced their judgements of the two profiles on perceptions of effort, trait effort, and deservingness. In Study 3, one-third of participants (33.33%) reported having previous experience with hiring or recruitment decisions. The experiences that they reported included screening resumes, conducting interviews, and providing input in selection decisions. Interactions involving hiring experience were not significant in predicting effort perceptions or deservingness judgments (p's > .05). However, the hiring experience × profile interaction predicted judgments of trait effort, F $(1, 97) = 3.97$, $p = .05$. Participants who had some previous experience with hiring decisions, as well as those who did not have such experience, perceived the improved candidate to be more hardworking than the consistent candidate (p's < .001); but the

difference was slightly larger among those who had previous experience. In Study 5, 25.6% of participants reported having previous experience with hiring or recruitment decisions (e.g., scanning resumes, interviewing job candidates at their workplace, etc.). Interactions involving hiring experience were not significant in predicting effort perceptions, trait effort, or deservingness judgments (p's > .05). In Study 6, 29.6% of participants reported having previous experience with hiring or recruitment in their workplace. However, these participants were split between the four experimental conditions (6-19 participants per condition) in a way that made it difficult to examine and interpret the potential moderating role of hiring experience in this study. Overall, the results of the present studies provide no evidence of hiring experience eliminating the use of improvement as a heuristic for judging effort. However, more research is needed to examine the judgments of experts who have substantial experience with hiring decisions, because the present studies do not speak directly to judgment processes among those who have a high level of expertise.

Appendix C

Employee Profiles (Study 1B)

John Thompson and Andrew McDonald are software developers in ICSA Software. Their role as software developers requires good attention to detail and the ability to work efficiently under time pressure. John and Andrew have been working in the company as junior developers since 2008.

Every year, the performance of employees in ICSA Software is evaluated by the employees' supervisors.

The following performance ratings of John and Andrew represent the overall evaluations that they received each year from their supervisors. Every year, performance was rated on a 10-point scale with **1 indicating unsatisfactory performance, and 10 indicating excellent performance.**

First Name: Andrew
Last Name: McDonald
Gender: male
Birthdate: 01/10/1982

First Name: John
Last Name: Thompson
Gender: male
Birthdate: 06/08/1981

In this section, we are interested in the general impression that you have formed about John and Andrew, based on the short profiles that you read.

Each of the following items includes an opposite pair of characteristics that we can use to describe other people. Please read each pair and select the number that best represents where you think each of the two employees stands in terms of these characteristics.

I think that John is ...								I think that Andrew is ...						
Not intelligent 1	2	3	4	5	6	Intelligent 7		Not intelligent 1	2	3	4	5	6	Intelligent 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Stupid 1	2	3	4	5	6	Smart 7		Stupid 1	2	3	4	5	6	Smart 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not competent 1	2	3	4	5	6	Competent 7		Not competent 1	2	3	4	5	6	Competent 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not successful 1	2	3	4	5	6	Successful 7		Not successful 1	2	3	4	5	6	Successful 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not ambitious 1	2	3	4	5	6	Ambitious 7		Not ambitious 1	2	3	4	5	6	Ambitious 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Lazy 1	2	3	4	5	6	Hardworking 7		Lazy 1	2	3	4	5	6	Hardworking 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not motivated 1	2	3	4	5	6	Motivated 7		Not motivated 1	2	3	4	5	6	Motivated 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not persistent 1	2	3	4	5	6	Persistent 7		Not persistent 1	2	3	4	5	6	Persistent 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not determined 1	2	3	4	5	6	Determined 7		Not determined 1	2	3	4	5	6	Determined 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Shy 1	2	3	4	5	6	Outgoing 7		Shy 1	2	3	4	5	6	Outgoing 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not likable 1	2	3	4	5	6	Likable 7		Not Likable 1	2	3	4	5	6	Likable 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Not friendly 1	2	3	4	5	6	Friendly 7		Not friendly 1	2	3	4	5	6	Friendly 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
Cold 1	2	3	4	5	6	Warm 7		Cold 1	2	3	4	5	6	Warm 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

I think that John is ...								I think that Andrew is ...						
An introvert 1	2	3	4	5	6	An extrovert 7		An introvert 1	2	3	4	5	6	An extrovert 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Overall, I think that my first impression of John is...								Overall, I think that my first impression of Andrew is...						
Very negative 1	2	3	4	5	6	Very positive 7		Very negative 1	2	3	4	5	6	Very positive 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Appendix D

Instructor Profiles (Study 1C)

Jane Smith and Susan King are two course instructors that joined Laurier in 2011. Below are the evaluations that Jane and Susan have received in each of their three years at Laurier. For every year, you will see ratings of overall quality, helpfulness, clarity and easiness.

These ratings were provided by students on an independent professor evaluation website that is not affiliated with the university.

2011		2011	
Jane Smith		**Susan King**	
School: Wilfrid Laurier University-Waterloo		School: Wilfrid Laurier University-Waterloo	
Location: **Waterloo**, ON		Location: **Waterloo**, ON	
Department: Psychology		Department: Psychology	

| 2.9 OVERALL QUALITY | 2.9 HELPFULNESS | 2.8 CLARITY | 3.1 EASINESS | | 4.1 OVERALL QUALITY | 4.1 HELPFULNESS | 4.0 CLARITY | 3.1 EASINESS |

2012

Jane Smith

School: Wilfrid Laurier University-Waterloo
Location: **Waterloo**, ON
Department: Psychology

| 3.5 OVERALL QUALITY | 3.3 HELPFULNESS | 3.6 CLARITY | 3.2 EASINESS |

2012

Susan King

School: Wilfrid Laurier University-Waterloo
Location: **Waterloo**, ON
Department: Psychology

| 4.1 OVERALL QUALITY | 4.0 HELPFULNESS | 4.2 CLARITY | 3.2 EASINESS |

2013

Jane Smith

School: Wilfrid Laurier University-Waterloo
Location: **Waterloo**, ON
Department: Psychology

| 4.1 OVERALL QUALITY | 4.1 HELPFULNESS | 4.0 CLARITY | 3.1 EASINESS |

2013

Susan King

School: Wilfrid Laurier University-Waterloo
Location: **Waterloo**, ON
Department: Psychology

| 4.1 OVERALL QUALITY | 4.1 HELPFULNESS | 4.0 CLARITY | 3.1 EASINESS |

Please read the following question carefully and select the number that best represents your own opinion about the two course instructors:

How much effort do you think **Jane** spent on her teaching job in the past 3 years?							How much effort do you think **Susan** spent on her teaching in the past 3 years?						
No effort at all 1	2	3	4	5	6	A lot of effort 7	No effort at all 1	2	3	4	5	6	A lot of effort 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

In this section, we are interested in the general impression that you have formed about Jane and Susan, based on the profiles that you read.

Each of the following items includes an opposite pair of characteristics that we can use to describe other people. Please read each pair and select the number that best represents where you think each of the two instructors stands in terms of these characteristics.

	I think that **Jane** is ...							I think that **Susan** is ...					
Not intelligent 1	2	3	4	5	6	Intelligent 7	Not intelligent 1	2	3	4	5	6	Intelligent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Stupid 1	2	3	4	5	6	Smart 7	Stupid 1	2	3	4	5	6	Smart 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Not competent 1	2	3	4	5	6	Competent 7	Not competent 1	2	3	4	5	6	Competent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Not successful 1	2	3	4	5	6	Successful 7	Not successful 1	2	3	4	5	6	Successful 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Not ambitious 1	2	3	4	5	6	Ambitious 7	Not ambitious 1	2	3	4	5	6	Ambitious 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Lazy 1	2	3	4	5	6	Hardworking 7	Lazy 1	2	3	4	5	6	Hardworking 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Not motivated 1	2	3	4	5	6	Motivated 7	Not motivated 1	2	3	4	5	6	Motivated 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is ...							I think that **Susan** is ...					
Not persistent 1	2	3	4	5	6	Persistent 7	Not persistent 1	2	3	4	5	6	Persistent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that **Jane** is …								I think that **Susan** is …						
Not determined 1	2	3	4	5	6	Determined 7		Not determined 1	2	3	4	5	6	Determined 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that **Jane** is …								I think that **Susan** is …						
Shy 1	2	3	4	5	6	Outgoing 7		Shy 1	2	3	4	5	6	Outgoing 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that **Jane** is …								I think that **Susan** is …						
Not likable 1	2	3	4	5	6	Likable 7		Not Likable 1	2	3	4	5	6	Likable 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that **Jane** is …								I think that **Susan** is …						
Not friendly 1	2	3	4	5	6	Friendly 7		Not friendly 1	2	3	4	5	6	Friendly 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that **Jane** is …								I think that **Susan** is …						
Cold 1	2	3	4	5	6	Warm 7		Cold 1	2	3	4	5	6	Warm 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that **Jane** is …								I think that **Susan** is …						
An introvert 1	2	3	4	5	6	An extrovert 7		An introvert 1	2	3	4	5	6	An extrovert 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	Overall, I think that my first impression of Jane is…								**Overall, I think that my first impression of Susan is…**						
Very negative 1	2	3	4	5	6	Very positive 7		Very negative 1	2	3	4	5	6	Very positive 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Appendix E

Confirmatory Factor Analysis of Trait Effort and Trait Ability in Studies 1A-1C

To verify that the trait competence and the trait ability indices reflected two types of traits that were distinguishable from one another, we conducted Confirmatory Factor Analyses. First, we combined the data sets from Studies 1A-1C (n = 242). For each type of profile (improved vs. consistent), we specified the structural model and conducted Confirmatory Factor Analyses using the software program AMOS (Arbuckle & Wothke, 1999). Seven items were included in each analysis: hardworking, motivated, persistent, determined, competent, intelligent, and smart. The first four items were intended to measure perceptions of trait effort in the respective profile, whereas the latter four were intended to measure trait ability. The results are presented in the two figures below (Appendix Figure 1 and Appendix Figure 2).
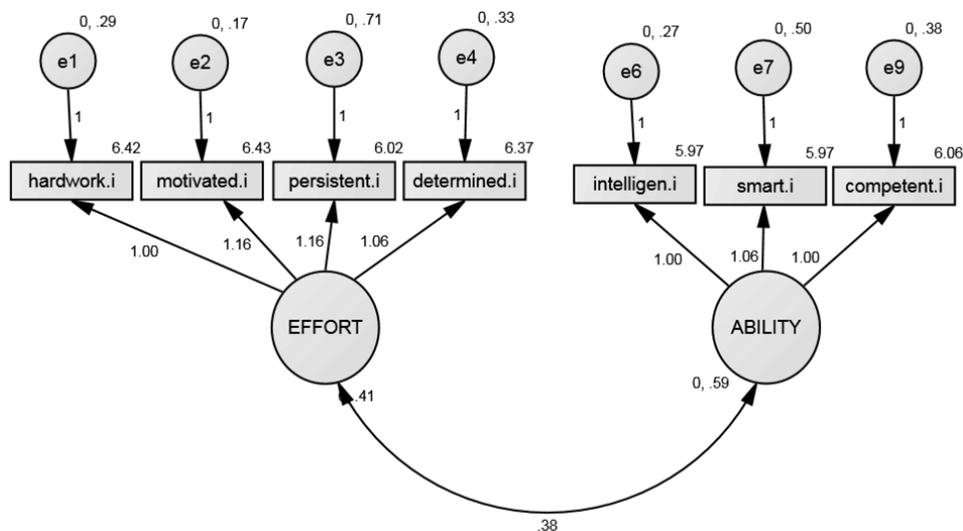
Chi-square = 32.335, df = 13, p = .002
CFI = .977, RMSEA = .076, pclose = .090

Appendix Figure 1. Confirmatory factor analysis of trait ability and trait effort in the improved profiles (Studies 1A-1C). The two-factor model fit is adequate for the improved profiles. The unstandardized estimates are presented in the above diagram.
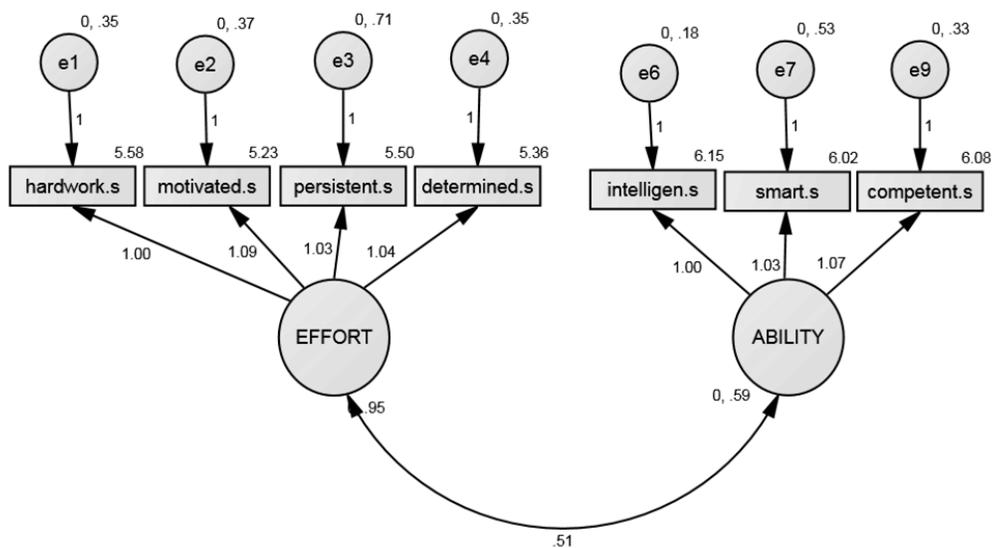
Chi-square = 18.438, df = 13, p = .142
CFI = .995, RMSEA = .040, pclose = .614

Appendix Figure 2. Confirmatory factor analysis of trait ability and trait effort in the consistent profiles (Studies 1A-1C). The two-factor model fit is excellent for the consistent profiles. The unstandardized estimates are presented in the above diagram.
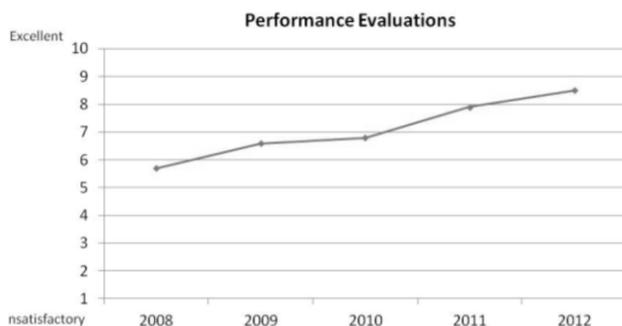
Appendix F

Employee Profiles (Study 2)

John Thompson and Andrew McDonald are software developers in ICSA Software. Their role as software developers requires good attention to detail and the ability to work efficiently under time pressure. John and Andrew have been working in the company as junior developers since 2008.
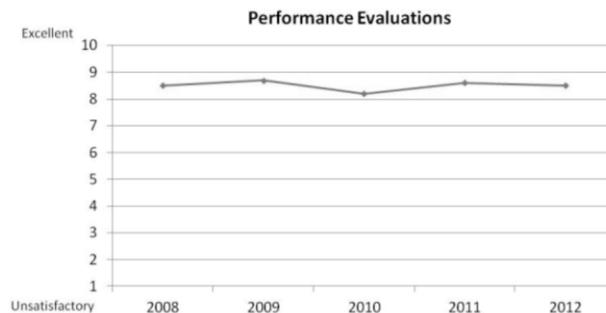
Every year, the performance of employees in ICSA Software is evaluated by the employees' supervisors.

The following performance ratings of John and Andrew represent the overall evaluations that they received each year from their peers and supervisors. Every year, performance was rated on a 10-point scale with **1 indicating poor performance, and 10 indicating outstanding performance.**

First Name: John
Last Name: Thompson
Gender: male
Date of Birth: 06/08/1981

Year	Overall Performance Level
2008	5.7
2009	6.6
2010	6.8
2011	7.9
2012	8.5

First Name: Andrew
Last Name: McDonald
Gender: male
Date of Birth: 01/10/1982

Year	Overall Performance Level
2008	8.5
2009	8.7
2010	8.2
2011	8.6
2012	8.5

Trend focus condition:

The first thing that we would like you to do is to **examine the overall performance trend for the two employees over their five years at *ICSA Software*.** In other words, please describe briefly how the overall performance for each of the employees changed -or did not change- over their five years in the company.

John's Performance Trend	Andrew's Performance Trend

Average focus condition:

The first thing that we would like you to do is to <u>calculate the average performance for each of these employees over their five years in *ICSA Software*</u>. Remember that to calculate the average, all you need to do is add up the five evaluation points and then, divide the sum by five. You can use the calculator presented below.

John's Average	Andrew's Average
.	.

-
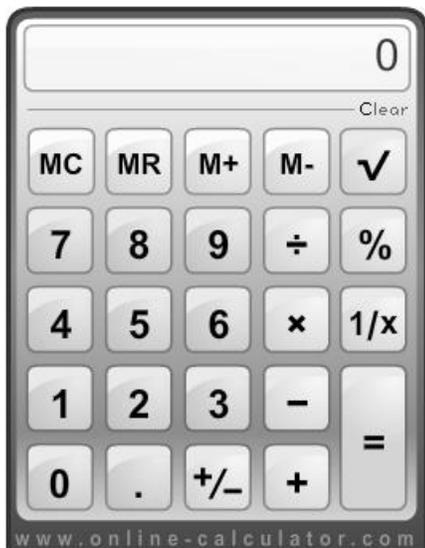
How difficult do you consider the previous question to be?

Not at all difficult 1	2	3	4	5	6	Very difficult 7
○	○	○	○	○	○	○

Please read the following question carefully and select the number that best represents your own opinion about the employees:

How much effort do you think **John** spent on his job in the past 5 years?							How much effort do you think **Andrew** spent on his job in the past 5 years?						
No effort at all 1	2	3	4	5	6	A lot of effort 7	No effort at all 1	2	3	4	5	6	A lot of effort 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

In this section, we are interested in <u>the general impression</u> that you have formed about John and Andrew, based on the short profiles that you read.

Each of the following items includes an opposite pair of characteristics that we can use to

describe other people. Please read each pair and select the number that best represents where you think each of the two employees stands in terms of these characteristics.

I think that John is ...							I think that Andrew is ...						
Not intelligent 1	2	3	4	5	6	Intelligent 7	Not intelligent 1	2	3	4	5	6	Intelligent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Stupid 1	2	3	4	5	6	Smart 7	Stupid 1	2	3	4	5	6	Smart 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not competent 1	2	3	4	5	6	Competent 7	Not competent 1	2	3	4	5	6	Competent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not successful 1	2	3	4	5	6	Successful 7	Not successful 1	2	3	4	5	6	Successful 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not ambitious 1	2	3	4	5	6	Ambitious 7	Not ambitious 1	2	3	4	5	6	Ambitious 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Lazy 1	2	3	4	5	6	Hardworking 7	Lazy 1	2	3	4	5	6	Hardworking 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not motivated 1	2	3	4	5	6	Motivated 7		Not motivated 1	2	3	4	5	6	Motivated 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not persistent 1	2	3	4	5	6	Persistent 7		Not persistent 1	2	3	4	5	6	Persistent 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not determined 1	2	3	4	5	6	Determined 7		Not determined 1	2	3	4	5	6	Determined 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Shy 1	2	3	4	5	6	Outgoing 7		Shy 1	2	3	4	5	6	Outgoing 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not likable 1	2	3	4	5	6	Likable 7		Not Likable 1	2	3	4	5	6	Likable 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not friendly 1	2	3	4	5	6	Friendly 7		Not friendly 1	2	3	4	5	6	Friendly 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...							I think that Andrew is ...					
Cold 1	2	3	4	5	6	Warm 7	Cold 1	2	3	4	5	6	Warm 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that John is ...							I think that Andrew is ...					
An introvert 1	2	3	4	5	6	An extrovert 7	An introvert 1	2	3	4	5	6	An extrovert 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

Overall, I think that my first impression of John is…							Overall, I think that my first impression of Andrew is…						
Very negative 1	2	3	4	5	6	Very positive 7	Very negative 1	2	3	4	5	6	Very positive 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

Appendix G

Profiles of Sales Representatives (Study 5)

John Thompson and Andrew MacDonald are two sales representatives at IHC Canada. IHC is a company that provides innovative electric heating systems to home owners in Canada. John and Andrew joined the company as sales representatives in 2009. Their job is to acquire new customers by contacting home owners and educating them about the innovative electric heating systems that IHC offers.

The graphs below display the unit sales for John and Andrew over the course of their career with IHC Canada. In other words, they show you how many heating system units John and Andrew managed to sell each year.

(Low ambiguity condition: Note that the average for sales representatives in IHC Canada is around 250 units sold per year.)

John Thompson

Unit Sales

Andrew MacDonald

Unit Sales
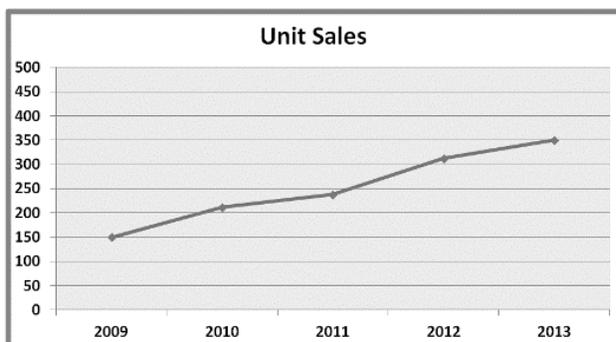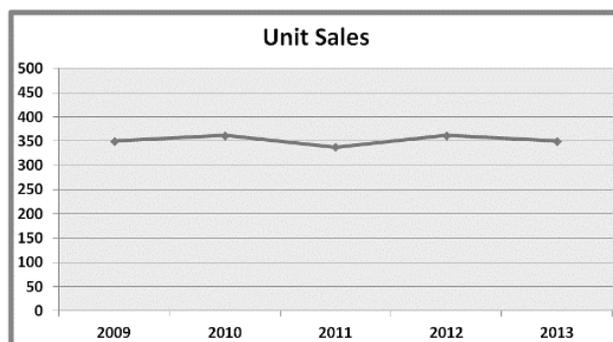
Overall, how much effort do you think each of the employees spent in his job in the past five years?

Please drag the tab and place it at the appropriate place on each scale to indicate your answer.

No effort at all   A lot of effort

0   10   20   30   40   50   60   70   80   90   100

John

Andrew

In this section, we are interested in the general impression that you have formed about John and Andrew, based on the short profiles that you read.

Each of the following items includes an opposite pair of characteristics that we can use to describe other people. Please read each pair and select the number that best represents where you think each of the two employees stands in terms of these characteristics.

I think that John is ...							I think that Andrew is ...						
Not intelligent 1	2	3	4	5	6	Intelligent 7	Not intelligent 1	2	3	4	5	6	Intelligent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Stupid 1	2	3	4	5	6	Smart 7	Stupid 1	2	3	4	5	6	Smart 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not competent 1	2	3	4	5	6	Competent 7	Not competent 1	2	3	4	5	6	Competent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not successful 1	2	3	4	5	6	Successful 7	Not successful 1	2	3	4	5	6	Successful 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not ambitious 1	2	3	4	5	6	Ambitious 7	Not ambitious 1	2	3	4	5	6	Ambitious 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Lazy 1	2	3	4	5	6	Hardworking 7	Lazy 1	2	3	4	5	6	Hardworking 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not motivated 1	2	3	4	5	6	Motivated 7	Not motivated 1	2	3	4	5	6	Motivated 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

I think that John is ...							I think that Andrew is ...						
Not persistent 1	2	3	4	5	6	Persistent 7	Not persistent 1	2	3	4	5	6	Persistent 7
○	○	○	○	○	○	○	○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Shy 1	2	3	4	5	6	Outgoing 7		Shy 1	2	3	4	5	6	Outgoing 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not likable 1	2	3	4	5	6	Likable 7		Not Likable 1	2	3	4	5	6	Likable 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Not friendly 1	2	3	4	5	6	Friendly 7		Not friendly 1	2	3	4	5	6	Friendly 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

	I think that John is ...								I think that Andrew is ...					
Cold 1	2	3	4	5	6	Warm 7		Cold 1	2	3	4	5	6	Warm 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Overall, I think that my first impression of John is... | **Overall, I think that my first impression of Andrew is...**

Very negative 1	2	3	4	5	6	Very positive 7		Very negative 1	2	3	4	5	6	Very positive 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Now, we would like you to read about a situation, and to imagine it as if it is taking place.
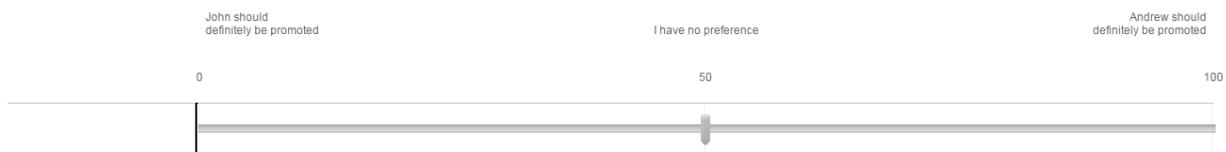
The company is offering a **promotion opportunity** to one of its current sales representatives. John and Andrew are the two candidates for this promotion. Imagine being part of the selection committee.

How deserving would John be of the promotion?								How deserving would Andrew be of the promotion?						
Not at all deserving 1	2	3	4	5	6	Very deserving 7		Not at all deserving 1	2	3	4	5	6	Very deserving 7
○	○	○	○	○	○	○		○	○	○	○	○	○	○

Who, do you think, should be promoted?
We would like you to make your judgment by placing the tab at the appropriate place on the line.

John should definitely be promoted	I have no preference	Andrew should definitely be promoted
0	50	100

Now, we would like you to recall the situation which you read about in a previous page. <u>Which of the following decisions were you instructed to imagine?</u>

○ Selecting one of the employees for a promotion

○ Selecting one of the employees to receive an award

○ I don't know

Appendix H

Detailed Results and Forest Plots of the Meta-Analyses (Study 7)
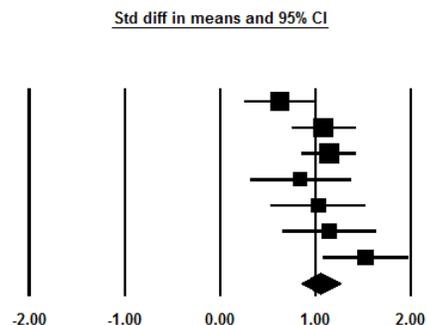
Effort Perceptions

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
			Statistics for each study				
Study 1A	0.375	0.198	0.039	-0.013	0.763	1.894	0.058
Study 1B	1.036	0.181	0.033	0.682	1.390	5.738	0.000
Study 1C	1.276	0.193	0.037	0.899	1.654	6.630	0.000
Study 2 (Control Condition)	0.582	0.290	0.084	0.013	1.151	2.004	0.045
Study 3 (Control Condition)	0.721	0.309	0.095	0.116	1.327	2.334	0.020
Study 5 (High Ambiguity)	0.817	0.261	0.068	0.305	1.329	3.127	0.002
Study 6 (High Ambiguity)	1.336	0.225	0.051	0.896	1.777	5.944	0.000
	0.896	0.145	0.021	0.612	1.179	6.186	0.000
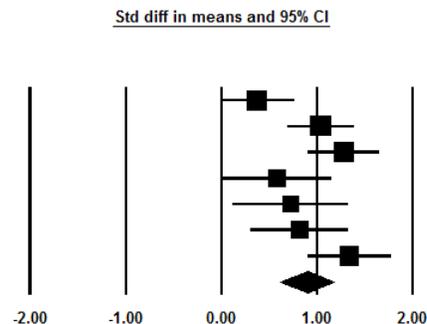
Trait Effort

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
			Statistics for each study				
Study 1A	0.626	0.192	0.037	0.249	1.002	3.260	0.001
Study 1B	1.082	0.171	0.029	0.746	1.417	6.322	0.000
Study 1C	1.140	0.146	0.021	0.853	1.427	7.793	0.000
Study 2 (Control Condition)	0.840	0.272	0.074	0.307	1.373	3.088	0.002
Study 3 (Control Condition)	1.028	0.256	0.065	0.527	1.529	4.022	0.000
Study 5 (High Ambiguity)	1.143	0.252	0.063	0.650	1.637	4.540	0.000
Study 6 (High Ambiguity)	1.524	0.231	0.053	1.071	1.976	6.599	0.000
	1.054	0.103	0.011	0.852	1.256	10.222	0.000

Trait Competence

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
			Statistics for each study				
Study 1A	-0.504	0.122	0.015	-0.743	-0.265	-4.131	0.000
Study 1B	0.098	0.094	0.009	-0.086	0.282	1.043	0.297
Study 1C	0.011	0.086	0.007	-0.158	0.180	0.128	0.898
Study 2 (Control Condition)	-0.533	0.188	0.035	-0.901	-0.165	-2.835	0.005
Study 3 (Control Condition)	0.023	0.169	0.029	-0.308	0.354	0.136	0.892
Study 5 (High Ambiguity)	-0.022	0.176	0.031	-0.367	0.323	-0.125	0.901
Study 6 (High Ambiguity)	0.860	0.212	0.045	0.443	1.276	4.045	0.000
	-0.024	0.135	0.018	-0.289	0.241	-0.177	0.859

Deservingness Judgments

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	Std diff in means and 95% CI
Study 3 (Control Condition)	0.511	0.203	0.041	0.113	0.909	2.517	0.012	
Study 5 (High Ambiguity)	0.619	0.192	0.037	0.243	0.995	3.224	0.001	
Study 6 (High Ambiguity)	1.684	0.237	0.056	1.220	2.148	7.118	0.000	
	0.927	0.350	0.122	0.242	1.612	2.652	0.008	

-2.00   -1.00   0.00   1.00   2.00