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Creativity Works Wonders, But Who Will Truly Benefit?

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Abstract

In creativity evaluations there is a common gender bias favoring ideas presented by men even if the idea presented by women are exactly the same. One underlying characteristic of creativity is agency which is also more common in men, and which very likely affects creativity evaluations. In the current study we investigated the relationship between gender, agency, and creativity evaluations to explore the interplay between these factors. This was an online scenario experimental study where we presented blog posts containing a creative idea (life hack) in the form of a blog post. By varying gender and level of agency, we created four independent experimental conditions. The sample of $N = 172$ consisted mostly of first-year psychology students from the Netherlands and Germany. The results showed no main effect of gender on creativity evaluations and no main effect of agency on creativity judgments. The moderation effect of agency on gender and creativity ratings was also insignificant. The results show that neither gender, nor agency affect creative idea evaluations. Future research should focus on investigating whether gender biases only occur on domain-specific creativity outlets, as opposed to everyday creativity such as life hacks.

Keywords: creativity, agency, gender bias, femininity, masculinity

Creativity Works Wonders, But Who Will Truly Benefit?

Meet James, a 34-year-old man and Mary, his 34-year-old female coworker. They both work for uNlimited, a fresh start-up company. They are the same age, have a seemingly similar work attitude, and both dress business casual every day. They are Senior Marketing Experts, and both have a Master's degree from a prestigious university in the Netherlands. Imagine a situation in which James and Mary brainstorm over a creative slogan for the startup company they both work for. Since they must first clear the idea for the slogan with their supervisors, they set up two separate meetings with their bosses where both James and Mary will simultaneously present the slogan to a part of their board.

Until now, all the work on this project has been based on joint forces and even in preparing for the meetings they collaborate on the PowerPoint and delivery of the presentation. As a result, the following day James and Mary deliver the same exact presentation to two independent groups of bosses and wait for their evaluations of the slogan idea. When James finally hears back from the supervisors, they only have rave reviews to share with him congratulating him on the ingenuity of the slogan and admiring his contribution to the company's welfare. At the same time, Mary is faced with feedback from her supervisors and to her surprise the board is not cheering ferociously or even congratulating her on a clearly successfully delivered presentation. Instead, they just look a little bit confused and seemingly disappointed and tell her to think of something "catchier" because they "expected something more creative of her".

After their presentations James and Mary meet up for a quick chat to see how the other's presentations went and Mary is shocked to find out how drastically different James's performance was evaluated. She tries to figure out what could she have possibly done wrong to see such a different reaction from the supervisors, but hours later she is still baffled by this unexpected reaction. How did James get enthusiastic reactions to the same idea, while she

received more negative feedback? After all, they both worked on the same project, delivered the same presentation, and demonstrated the same idea while having a near similar career background. The inability to find the fault within her performance forced Mary to start asking herself, ‘Is it possible that some factors regardless of individual differences in creativity, such as gender, played a role in how our idea was perceived and evaluated by the board?’ Is it actually possible that just because she is a woman and James is a man the creativity of the idea was assessed differently? In this paper, I want to find an answer to how gender and personal level of agency affect creativity perceptions and evaluations, to help Mary understand the bizarre situation she found herself in.

Literature review

To help Mary find the answer to her pending question there are a couple of key concepts that require further explanation. After all, she is trying to understand if it was the level of creativity between her and James that was to blame for the unenthusiastic reaction from the board or factors out of her control? In this project I will zoom in on three particular aspects related to creativity perception namely creativity, gender of the idea source as well as their personal level of agency. The research questions that I want to answer are: to what extent does gender bias and agency affect creativity evaluations, and how does agency affect this relationship? Is it possible to consider agency as the moderating factor between gender bias and evaluations? In the literature review part of this paper, I will first focus on explaining creativity, then move on to gender of the idea presenter and end with describing how agency interplays with the other two variables. In the discussion section I will provide suggestions for areas of future research and examine the limitations of the current study.

Creativity

According to Sternberg and Lubart (1998) creativity, in the Western context, shows in products that are novel and appropriate. Novelty refers to the originality and uniqueness of the

idea; for the idea to be novel it must be distinct from other products in the field. On the other hand, for appropriateness to be met, the usefulness of the idea must be assured; an appropriate idea is such that meets a need in particular circumstances. This definition of creativity is sufficient yet not complete because originality and appropriateness are not enough to make an idea creative. For this reason, after the first proper definition of creativity was published (Sternberg, 1998), another group of researchers (Litchfield et al., 2015) attempted to delve deeper into the topic of creativity. It was their intent to provide a more fitting and exhaustive definition of creativity. The result of their endeavors was a somewhat superior definition of creativity which still posited the novelty of an idea; however, it additionally mentioned the aspects of feasibility and value which constituted the usefulness of an idea. Just as in the previous definition of creativity (Sternberg, 1998), novelty according to Litchfield et al. (2015) referred to originality and unlikeness to previously existing products. On the other hand, usefulness consists of feasibility described as practicality and possibility of implementation, and value which means potential effectiveness or success of a product.

The research on creative behavior and output is vastly developed at this point (De Jonge et al., 2018; Karwowski & Beghetto, 2019; Tsegaye et al., 2019; Van Damme et al., 2019). However, a recent development around creativity research started covering not only creative output but also the receiving side of creativity (Zhou et al., 2019). Mueller et al. (2018) highlighted the significance of recognizing ideas that were already generated instead of engaging in the creation process all over again while simultaneously stressing the danger of judging creative ideas as non-creative. At the same time, Zhou et al. (2017) mentioned how attention and cognitive efforts directed at a pre-existing idea allow people to produce more relevant use for its application. This proves that it is worth giving focus to ideas that were generated before in order to find a suitable fitting for them. To further enrich this branch of studies, the following paper focuses on the receiving side of creativity as well. This endeavor

is very important because apart from ingenious idea generation another vital aspect of idea usability is how the concept is perceived by the target audience. Since this is a relatively fresh side of the creativity research, we believe that any studies in this domain will be regarded as highly valuable.

Biases in Creativity Judgments

Creativity judgments can be distorted by many trivial factors seemingly unrelated to perception of creativity. Even banalities such as the attractiveness of one's name can influence the rating of submitted work in a way that higher ratings are given to works signed with a more attractive name (Lebuda & Karwowski, 2013). Research also shows that collaboratively created artwork receives lower creativity judgments than work produced by single authors (Smith & Newman, 2014). Similarly, when the audience perceives a piece of art to have taken longer to complete, their creativity judgments are higher as well (Kruger et al., 2004). It is also evident that workers who had a non-native accent would receive less funding for novel entrepreneurial ventures because juries' assessment of creativity was overshadowed by the non-standard accent, suggesting lower political skills (Huang et al., 2013).

As demonstrated above, there are numerous means in which biases can disrupt creativity judgements. However, since this paper focuses on discovering how gender influences creativity judgments, in the following paragraphs I will describe how the two factors correspond with each other.

Gender

Before reviewing gender biases in creativity judgments, it is important to precisely explain the meaning of gender within this study. From the psychological point of view, gender can be understood as "the condition of being male, female, or neuter; (...) gender implies the psychological, behavioral, social, and cultural aspects of being male or female (i.e., masculinity or femininity)" (American Psychological Association [APA], n.d.). Consequently,

in this paper gender can be understood in terms of behaviors that are socially constructed and considered appropriate for a person of a specific sex. The bottom line is that each sex has a set of prescriptive rules on behavior, duties, position within a community that are considered appropriate.

Masculinity and Femininity

Through these gendered norms on male and female behavior, masculine or feminine personal profiles are built. As the name suggests, femininity is expected of women and masculinity of men (Abele, 2003; Abele & Wojciszke, 2007). Some of the most common features of femininity are affection, compassion, loyalty, warmth, or gentleness. On the other hand, features characterizing masculinity are assertiveness, dominance, independence, self-reliance, leadership or even aggression (Prentice & Carranza, 2002). In principle, femininity is driven by establishing relations with others, also called communion, while masculinity pertains to being self-dependent and seeking solitude, which means being agentic (Pilar Matud et al., 2014). Researchers also found femininity to be more influential on the social locus of control than masculinity since the former is related to effective social cognition and maintenance of interpersonal interactions, while the latter is associated with goal-driven behavior (Maharishi & Rathnasabapathy, 2016).

Agency

Agency can be simply explained as “the state of being active, usually in the service of a goal, or of having the power and capability to produce an effect or exert influence” (APA, n.d.). Some researchers acknowledge that agency as well as communion¹ are basic human predispositions (Saragovi et al., 1997), which help to describe individual’s motivation and approach to interpersonal relations respectively. Moreover, they mention agency as the building block for self-esteem (Żemojtel-Piotrowska et al., 2016). According to Abele and

¹ Pursuit of harmony with others by maintaining and fostering social relations.

Wojciszke (2007) agency is claimed by pursuing self-expansion and independence and is often associated with traits such as ambition, efficient goal striving, or willingness to lead and assert oneself over others.

It is often assumed that men will possess more agentic traits than women because agentic behaviors are seen as typically instrumental (using them as tools to achieve a goal) and therefore, masculine ones (Abele, 2003; Saragovi et al., 1997). Women, on the other hand, are expected to show highly communal behaviors, which are associated with caring for others, such as childcare, and relate to expressiveness of emotion usually ascribed to femininity (Abele & Wojciszke, 2007; Saragovi et al., 1997). That is likely the case because certain concepts such as pursuit of dominance, goal-attainment, competence, or independence are traditionally seen as more appropriate for the main house income providers who traditionally are men (Abele, 2003). At the same time, since women “should be” sensitive to other’s needs, loving, and embracing, it is believed that they should display many communal behaviors (Rudman & Glick, 2001). These gender-based prescriptions can be harmful to individuals that do not fit these profiles, such as men low/women high on agency, or men high /women low on communality. The struggle can be described in terms of conflicting prescriptive gender norms and stereotypes that persist in the society.

It seems that people of either gender see the relevance of being highly agentic for themselves while not seeing the same usefulness of the quality in others (Abele & Wojciszke, 2007). On the other hand, Abele’s and Wojciszke’s research (2007) also showed that communion is more relevant and desired from others, rather than from oneself. Even though ideas about how women and men should behave and present themselves to the society have already been deeply embedded into fundamental beliefs about the world, it is not impossible to challenge them (Eagly & Steffen, 1984). In their research, Eagly and Steffen (1984) found that since stereotypically women would stay at home with the kids and act as housewives,

those who have joined the paid workforce were considered as more agentic than male coworkers. The phenomenon was explained by saying that if women, who are usually not required to work, choose to have a job, they are exceptionally high in agency even more so than some men.

Moreover, Abele (2003) found that there was a reciprocal impact between objective and subjective career success and level of agency. Level of agency predicted objective and subjective career success at a later point, meanwhile agency measured at a later point was also higher depending on higher career success. These findings show that to battle the gender stereotypical presumptions and give equal opportunities to every employee agency must be perceived as a trait acceptable of both men and women.

Gender Biases

Unfortunately, challenging gender stereotypes is not always beneficial for those who choose to defy them. Sometimes, women tend to face backlash when they appear to be more agentic than communal, which is not well received by the society (Rudman & Glick, 2001). This happens because agentic women violate the gender norm, and therefore, are perceived as “insufficiently feminine” (Rudman & Glick, 2001, p. 744). This can be disruptive to women’s careers because even though they appear as highly competent, there is still stigma surrounding their navigation around the social environment. However, the real problem occurs when considering the values that constitute a good employee, because characteristics of such people usually call for traits of highly agentic people (Rudman, 1998). This might be good news for male employees, who by default are expected to show these qualities, nonetheless, it seems that, for females, there is no ‘approved’ course of action where they cannot reach a win-win situation (Rudman & Glick, 2001).

According to Rudman and Glick (2001) it appears that women must decide on the sacrifice they are making, which is either being seen as a well performing, goal-oriented,

confident leader, or being seen as a “true woman”. Rudman (1998) explained how self-promotion, one of the traits of agentic behavior, can be beneficial in the process of hiring or granting promotions. Self-promotion is linked with desirable characteristics (for example confidence or ambition) of an employee in various professional fields. Given that only women face this kind of unfair treatment it becomes apparent that there is a clear gender bias in the workplace. Such bias favors men over women both of whom possess desirable traits that are nonetheless seen as typically masculine, thereby discrediting the female worker.

Gender Stereotypes and Creativity

Seeing how gender prejudice affects performance in the workplace, the question becomes, ‘What is the relation between gender stereotypes and creativity?’ Proudfoot and colleagues (2015) found that creative behavior is strongly related to traits that are seen as typically masculine. This is because being creative requires autonomy and self-direction, which are considered as key aspects of agency. Since agency is believed to be an inherently male quality, men are presumed to be more creative. Similar findings could be observed in Luksyte’s and colleagues’ research (2018), where drawing on gender stereotyped expectations of each gender, men’s creativity at work received more positive evaluations than women’s creative endeavors.

During their research, Proudfoot and colleagues (2015) showed that people rated masculine-agentic features as more important for both divergent and convergent thinking; Meanwhile, feminine-communal qualities were seen as having a significantly lower centrality to convergent or divergent thinking. Lebuda and Karwowski (2013) as well as Proudfoot et al. (2015) also discovered that creativity judgments depended on the domain of the idea. Women would receive higher ratings in female-associated fields like poetry or fashion, while men would get higher ratings in male-associated domains such as scientific theory proposition or architecture. A noteworthy outcome of the latter study (Proudfoot et al., 2015) was that even

though females seemed to benefit from higher evaluations in a feminine domain, altogether their creativity was evaluated lower than that of men under any condition.

Finally, a recently published meta-analysis on gender bias in creativity evaluations concluded that indeed there seems to be an observable, mediocre in size gender bias favoring men's creativity (Hora et al., 2021). The substantial amount of research in this field shows there are strong reasons to consider the evident gender bias in creativity. This bias favors men over women, because typically male-associated traits are perceived as indicators of higher creativity. However, almost all the studies considered for evaluation of the potential gender bias consist of ideas that are inherently artistic or used in work context. There is little, if any, studies that consider everyday spurs of creativity such as life hacks. For this reason, we want to test the hypothesis of gender influence on creativity in daily situations such as innovative ways to overcome unnecessary struggles of day-to-day problems. We propose the first hypothesis:

H1: Idea presented by a woman will be evaluated as less creative than an idea presented by a man.

Seeing that the gender biases prevalently occur in creativity evaluations (Hora et al., 2021; Lebuda & Karwowski, 2013; Luksyte et al., 2018; Proudfoot et al., 2015) raises a question concerning any potential moderators of this relationship. Proudfoot and colleagues (2015) identified agency as a factor that is strongly related to creative performance because it allows self-directed, independent and bold behavior. Karwowski and Beghetto (2019) also subscribe to the theory that creative action is a result of agentic behavior. The researchers recognized two underlying aspects of creativity, namely confidence in one's creative ability and the personal value of engaging in creative processes. Confidence can be considered as one of the typical traits of high agency, and therefore, might be more visible in people who are highly agentic (Abele & Wojciszke, 2007). Studies before (Charyton et al., 2013; Karwowski

& Beghetto, 2019) have shown that creativity is heavily dependent on traits such as riskiness or self-promoting behavior that are commonly seen in highly agentic individuals.

Additionally, Beghetto (2021) explains the importance of agentic behavior for creative action in face of a critical situation. According to his research, a crisis might catalyze highly agentic individuals to come up with creative solutions that solve the struggle, when other, more common methods of solving the issue no longer suffice.

Given that agency is one of the necessary but not sufficient blocks of creativity and might, therefore, aid idea presenters in coming across as creative, we are curious to investigate the level of agency as a potential buffer influencing the effect of gender on creativity assessment in the workplace. Based on extensive literature on agency as a factor influencing creativity (Beghetto, 2021; Charyton et al., 2013; Karwowski & Beghetto, 2019; Proudfoot et al., 2015) we theorize that higher levels of agency will result in higher creativity evaluations. Hence, the second hypothesis is:

H2: Idea presented by a highly agentic presenter will be evaluated as more creative than that of low agentic presenter.

On the other hand, there is still the question of gender stereotypes with regards to characteristics such as personal level of agency. Conway et al. (1996) described that across many cultures worldwide women are generally seen as less agentic than men because of their stereotyped role within the society. Research by Rudman (1998) showed that in hiring decisions self-promoting women were almost always faced with lower hireability scores compared to male candidates unless the male candidate was an exceptionally weak choice. When considering leadership positions, people also seem to associate highly agentic behaviors with male leaders rather than with female leaders (Scott & Brown, 2006). All these results make it obvious that women have a harder time with using their agentic behavior to the full potential, unlike men, of whom these traits are expected. We, therefore, propose a third

hypothesis that will test the moderation effect of level of agency between gender and creativity evaluations.

H3: Idea presented by a highly agentic woman will be evaluated as significantly less creative than that of a highly agentic man.

To clarify the relationship between the variables and posed hypotheses, there is a graphic depiction of the research model in Figure 1.

Methods

It should be noted that this study was used to collect data for two master theses. The second thesis project was written by Damijan Jungerius (2022) who helped design the research, the creation of the online study in Qualtrics (Qualtrics, Provo, UT, 2020) and additionally aided with recruitment of participants. All the variables included were used in either one or both master theses.

Participants

The final sample (N = 172) consisted of 78.9% females and 21.1% males. The vast majority (48%) of the participants were Dutch, followed by 25.4 percent Germans, and a lower number (5.8%) of Polish participants. The rest of the participants (20.8%) were from neither of the previously listed countries. The questionnaire did not require the participants to share their age because we believed that this question would not influence the answers during the study. Additionally, according to the new General Data Protection Regulation (GDPR) measures enforced at the Rijksuniversiteit Groningen (RUG) we had to justify asking any identifying questions.

The majority of participants approached for the study (78.6%) were first-year Psychology students at the RUG. As part of the first-year research methodology course called Introduction to Research Methods they were required to collect a total of 36 research-participation (SONA) points. By completing the current online study they were granted 0.4

SONA credits. The rest of the participants (21.4%) were approached personally by the researchers and the snowballing sampling method was encouraged to gather more diverse responses. They often reported that they studied Psychology as well (37.9%), and a couple of responses indicated that the area of expertise of the participants was Architecture (17.2%). The rest of the participants (44.9%) were either working, did not indicate their area of expertise, or studied a subject that was not mentioned. The participants who were approached personally, unlike the first-year Psychology students from the SONA pool, did not receive any compensation for completing the study.

Participants were excluded when they did not complete the questionnaire, failed two or more attention checks, or took too long to complete the questionnaire. The amount of time that we considered too long was initially people who took more than 24 hours to complete the study. There were three such cases in the original sample. After the three extreme outliers were removed, we inspected the data for outliers from the leftover sample. Since this is a scenario study the element of active engagement with the material was of utmost importance. Therefore, if a person took longer than 28 minutes to complete the study, we excluded their answer. There were six such apparent cases after we excluded the three initial extreme values leading to the total of nine cases removed due to the amount of time, they took to fill out the survey.

Procedure

The procedure differed slightly between participants approached through the SONA system and those approached directly or by snowballing.

The first-year Psychology students of the RUG entered the questionnaire by signing up via the SONA pool. The questionnaire was filled out online, via a computer or mobile phone. The first step of the study was informing the students about the purpose of the research and asking them to give us their informed consent. Once they agreed with their data being stored

the participants read a small description of what was expected of them during the study. They were told to imagine themselves being in the role of a recruiter at the company uNlimited. The exact text (Appendix A) and all the study materials can be found in the Appendices section. Next, they were presented with a blog description of either Mary or James. Afterwards, the participants presented with one of two life hacks, a ‘masculine’ life hack, or a ‘feminine’ life hack. Next, the participants had to rate the creativity of the life hack on different aspects using sliders. Afterwards, the participants had to answer questions about the creativity level of Mary/James, the personality of Mary/James, and the agency level of Mary/James using Likert scales. Additionally, participants were asked if they would hire Mary/James. The personality and hiring questions were used as distractors. Next, participants had to answer attention checks. Finally, the participants had to answer questions regarding demographics (nationality, gender, and studies), rate their personal creativity level, and indicate whether they paid attention throughout the study. Instead of a debriefing the participants received a message telling them they would receive the debriefing once data collection has finished.

The procedure for non-SONA participants was identical to the procedure of SONA participants, apart from two aspects. Firstly, non-SONA participants were approached by the researchers and sent a link to the questionnaire via email. Secondly, non-SONA participants were debriefed directly after finishing the questionnaire.

Design

Qualtrics was used to carry out the survey. The participants were able to fill out the survey in English. The survey contained 53 items of which four were manipulation checks and two were attention checks.

Independent variables

Gender of Idea Presenter. One of the independent variables in the study was gender of the idea presenter. A between-subject study design was used, and there were two levels to this variable, namely Male (James) and Female (Mary). To make sure the gender of the idea presenter became salient the participants were shown a picture (Appendix B) of the candidate. Furthermore, the participants had to read a blog post introduction which started and ended with the name of the candidate (James/Mary). The full blog post introduction can be found in Appendix C. Additionally, the questions the participants answered regarding the idea presenter all included the name of the candidate.

Agency of Idea Presenter. The other independent variable was the level of agency evident in the blog post of the idea presenter. There were two levels to this variable: high and low agency. In the high agency condition the idea presenter used self-confident and self-promoting language that also pointed towards individual work. Examples of such sentences include “The tips that you will come across on my blog are unusual ways to fix everyday struggles. I am sure that they will make your life so much easier because I tried them out myself and tested them with my family and friends.” Conversely, in the low agency condition the language of the narration was pointing to self-doubt and dependence on another person. An example of that would be “The tips that you will come across on this blog are unusual ways to fix everyday struggles. I think that they might make your life easier because I asked my assistant to test them out on my family and friends.” The full texts containing blog posts of low and high agency conditions can be found in the Appendix C. This manipulation was based on a similar experiment conducted by Rudman and Glick (1999) where levels of agency were differed based on the level of self-promotion and confidence in one’s abilities.

For measuring the perceived level of agency of the idea presenter we used two sets of instruments, the Personal Attributes Questionnaire (PAQ) by Spence and Helmreich (2021)

originally published in 1978, and the Gender-Stereotype Index (GSI) previously used by Rudman and Glick (2001).

PAQ. The PAQ was adjusted to only inquire about the agentic values of an idea presenter, and consequently consisted of seven items. The participant had to assess the traits by answering the following question “[Mary/James] seems like a person who...”. An exemplary item to be assessed would be “... is very self-confident”, or “... stands up very well under pressure” (Appendix E). The items were to be assessed using a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). Cronbach’s alpha for this scale is $\alpha = .31$. However, when the item that was reverse coded is removed the alpha instantly increases to .53.

GSI. The second scale, GSI, was also adjusted to inquire only about agentic qualities, and therefore, consisted of six items. The question corresponding to this scale was “[Mary/James] seems like a person who is...” and the answers were for e.g., “...Independent” (an almost identical item to that in PAQ), or “... Self-sufficient” (Appendix E). Just as in the scale above these attributes had to be rated using a 5-point Likert scale (1 = Not at all; 5 = Very much). The reliability of this scale is $\alpha = .64$.

PAQ and GSI Combined. When the scales are combined their joint reliability is .61. Additionally, when the reverse coded items are removed then the reliability increases to .71.

Manipulation Checks. In our research, every participant was only exposed to one experimental condition (between-groups design). Therefore, the success of our study was highly dependent on participants recognizing and considering the gender and level of agency of the idea presenter whose idea they had to evaluate. In order to clarify the extent to which our manipulations affected the participants we used two manipulation checks to inquire about the gender and the level of agency of the idea presenter. The manipulation checks were multiple choice questions with various number of choices and the participants had to choose the one correct option to be considered for the analysis. However, in the case of agency of the

idea presenter we also asked the participants to rate the perceived level of agency using the PAQ (Spence & Helmreich, 2021) and the GSI (Rudman & Glick, 2001) scales.

Gender of Idea Presenter. The first manipulation check inquired about the gender of the idea presenter therefore, we asked them “Who was the candidate?” (Appendix D), to check if the gender of the idea presenter had become salient to our participants. The participants were presented with four options, of which two were distractors. The other two options corresponded to the different conditions: “Mary, a woman in her 20s/30s” (female condition); “James, a man in his 20s/30s” (male condition).

Agency of Idea Presenter. The second manipulation check investigated the perceived level of agency of the idea presenter. One question, “Thinking back to the blogpost introduction description, did the candidate get any help in preparing the life hack?” (Appendix D), was used to check if the agency level of the idea presenter had become salient to the participants. The participants were presented with three options, of which, one was a distractor (Yes, they worked in a group). The other two options corresponded to the different conditions; “No, they worked alone” (high agency condition); “Yes, their assistant helped them” (low agency condition).

Furthermore, to verify that the perceived level of agency actually corresponded with the intended level of agency, the participants had to rate the 11 items from the PAQ and the GSI. This was aimed at clarifying in a quantitative manner the extent to which the idea presenter appeared as high or low in agency. We expected the idea presenters from the high agency condition to be rated higher on the PAQ and GSI scales than the idea presenters from the low agency condition.

Dependent variable

Creativity of Life Hack. To measure the creativity of the life hack questions from the 80-item Remised CPAM bipolar objective scale were used (Besemer & O’Quin, 1986). These

items were originally used to measure the creativity of items (shirts). Only questions from the original, the logical, and the useful subscale were used. These subscales were used since they seemed to match the three aspects of creativity the closest. In the end ten items were used, four from the original subscale (*useful - unusual*), two from the logical subscale (*make sense - senseless*), and four from the useful subscale (*effective - ineffective*) (Appendix G). These items were rated on a scale 5-point Likert scale (1 = uncreative attribute; 5 = creative attribute). Cronbach's alpha is $\alpha = .75$.

Attention Check

Three attention checks were used. Two attention checks were reversed coded questions; “[Mary/James] seems like a person who is not gifted” (Appendix F); “[Mary/James] seems like a person who cannot make decisions easily” (Appendix E). One attention check was put in among the personality questions and asked the participants to pick the agree option; “please pick agree” (Appendix H).

Results

Preliminary Analyses

Assumptions

Since this study required us to use the Univariate Analysis of Variance (ANOVA) method to compare the between-groups results, it was important that the assumptions underlying the method were assessed (Agresti, 2018). The normality check showed that scores of all main variables are normally distributed. Additionally, analyses of distribution of scores per gender showed that standard deviations are rather similar and therefore they can be considered as equal. The descriptive statistics of scores by gender can be found in Table 1 and can be understood in terms of scores on a scale between 1 and 5. Lastly, the observations between groups are independent of each other because every participant was only exposed to one of the four experimental conditions. Given that the assumption check was completed

successfully it can be concluded that using the mixed ANOVA analysis method is appropriate for this study.

Manipulations Checks

As mentioned in the Manipulation Checks subsections of the Method section, being a between-groups design our experiment depended on each participant becoming aware of and considering specific characteristics of the idea presenter. These characteristics were gender and the level of agency of the idea presenter. To test whether the manipulation worked we analyzed the scores on the PAQ and GSI scales, which indicated the perceived level of agency of the idea presenter as evaluated by the participants. The overall mean score on these combined scales of agency was a 3.3 ($SD = 0.4$) on a 5-point scale. This means that, in general, across all experimental conditions the participants perceived the idea presenter as having an above average level of agency. To further inquire about differences between groups, we conducted a 2x2 ANOVA between gender and intended level of agency on perceived agency. The results show that, as expected, the main effect of intended level of agency on perceived level of agency had a highly significant effect, $F(1,168) = 10.39, p = .002$. The means for both idea presenters in the high agency conditions ($M = 3.4, SD = 0.4$) were indeed perceived as more agentic than their low agency counterparts who on average scored a 3.2 ($SD = 0.4$). On the other hand, the main effect of gender manipulation on the perceived level of agency was insignificant, $F(1,168) = 0.39, p > .10$. Moreover, the interaction between gender and intended agency on perceived agency, also occurred to be insignificant, $F(1,168) = 2.94, p < .10$. These results suggest that even though the intended level of agency of the idea presenter only showed slight differences in group means, overall, the manipulations worked as intended.

Correlations

The correlations matrix with reliability of scales (where applicable) can be found in Table 2. Conducting the bivariate correlations analyses there were only two significant correlations. The first one was between the variables average agency and average idea presenter's creativity score ($r = .42, p < .001$). The second one occurred between idea presenter's creativity and idea/life hack creativity ($r = .40, p < .001$).

Even after the partial correlations were conducted, and gender was controlled for, the same trend could be observed. More precisely after conducting the partial correlations analyses it appeared that creativity of the idea presenter was positively related with scores on combined measures of agency ($r = .41, p < .001$). Additionally, the second correlation between idea presenter's creativity and idea/life hack creativity was still significant ($r = .39, p < .001$).

Hypothesis Testing

The first hypothesis assumed that gender of the idea presenter will influence the ratings of creativity of the idea. More precisely, we supposed that idea presented by a man will be rated as more creative than that presented by a woman. Using the Univariate Two-Way ANOVA for the analysis we can see that the main effect of gender of the idea presenter was insignificant for creativity evaluations, $F(1, 168) = 2.78, p < .10$. The result of this analysis was that we did not find enough evidence to assume that ideas presented by a man had higher evaluations than that presented by a woman. Therefore, we do not have enough proof to support hypothesis 1. To inquire about the other relevant values, please consult Table 3.

To test the assumption from hypothesis 2, stating that the idea presented by a person with higher agency will be evaluated as more creative than an idea presented by a person with lower agency. The main effect of agency on creativity evaluations was also insignificant, $F(1, 168) = 0.00, p > .10$. Therefore, we do not have enough reason to believe that the evaluations

of the idea increase as the agency is higher, meaning we cannot support the second hypothesis.

Lastly, we have the third hypothesis, which was an investigation into the moderating effect of agency level on gender and creativity evaluations. Interaction between these variables also missed the point of significance, $F(1, 168) = 2.15, p > .10$. The results show that there is no effect of agency over the relationship between gender and creativity evaluations. These results mean that we cannot support hypothesis 3. To inspect the results with visual help, please consult Figure 2.

Discussion

In the current paper we were investigating the gender differences that can interfere with perception of creativity and to what extent does agency play a moderating role in this relationship. Based on the results found in our sample we conclude that there was insufficient evidence pointing towards a gender bias evident in creativity evaluation. According to our findings, there were no visible differences in judgments of creativity regardless of whether they were presented by a man or by a woman. The level of agency also did not significantly affect creativity evaluations. These findings partially go against the previous research conclusions (Hora et al., 2021; Lebuda & Karwowski, 2013; Luksyte et al., 2018; Proudfoot et al., 2015).

A possible explanation of this occurrence is that a considerable number of participants in the study were female. According to Rudman's and Kilianski's (2000) study, women tended to report less explicit biases towards hard working women than men. The results for both male and female participants were the same, however, when implicit measures were used. Since this study used only explicit measures of a person's creativity assessment while more than four fifths of part-taking people were women, it might be that they did not want to be perceived as sexist. Nerdoly et al. (2020) also pointed out that men tend to have higher

scores on gender bias questionnaires than women. Perhaps if the ratio of female to male participants was more even the gender bias would be evident in their creativity assessments.

Another likely explanation is that the participants did not think about the gender of the idea presenter. After all, the participants were exposed to only one condition during their participation. However, if we exposed our participants to similar ideas, one presented by a man and the other one presented by a woman, chances are there would be more variety in their evaluations.

Lastly, it is possible that we could have perhaps made the manipulation of agency stronger. Our manipulation proved to have significantly and appropriately influenced our participants, such that high agency condition was actually evaluated as having more agency than the low agency condition. Nonetheless, as indicated by the grand and group means, the differences in perceived agency were rather small, regardless of showing significant results. The means should not and cannot necessarily dictate whether the manipulation was adequately crafted, however, they can be an indication for future research endeavors. Part of the problem might have been involving an assistant in the low agency condition because it might not have sufficiently reflected on the level of agency coming from the idea presenter. Perhaps a better comparison for the highly agentic condition would be an idea presenter who simply refuses to engage in the self-promoting, confident, and independent behavior but without mentioning help from another person. In this way the focus remains on the idea presenter themselves rather than dividing it among two people.

Theoretical and Practical Implications

Our findings enrich the area of psychological research in a professional context which is dedicated towards managing creativity and talent development at work or education. From a theoretical point of view, current results are highly valuable because they go against the strong theory that there is a gender bias in creativity evaluation. It is possible that the type of

creativity makes a difference in people's evaluations. In the case of life hacks, which have an everyday application, it is possible that the judgments do not differ as much for men and women as creative solutions in business or artistic fields. Perhaps the theory only holds when the creativity assessed has a professional value compensated by monetary benefits. This theory should be further explored in future research.

When considering practical applications, it might be used in a managerial context. Given the extensive literature background it would be worthwhile for managers to promote highly agentic behaviors among some of their subordinates. This, in turn, might help the employees in coming across as more creative, which might increase evaluations of their creative output. Positive judgments of creativity might further build the confidence in one's abilities leading to more productive work outcomes in the future (Chiang et al., 2014). However, given that we could not find high agency resulting in higher creativity evaluations those who do not feel comfortable exhibiting highly agentic behaviors would not lose significantly. The result could potentially be higher company success, effective managerial strategies recognized by the department heads, and more engaged and happy employees because they would not get pushed to do anything that is out of their comfort zone.

Limitations of the Study and Future Research

The unfortunate pitfall present in our study is also the reason why this experiment was relatively easy to execute during the times of pandemic, namely this being an online study. In the current times where possibilities to continue research offline in the laboratory or even continue in-person education are very limited, it becomes an additional challenge to gather data from participants. Our research team had to specifically adjust the study so that the data collection could happen without additional obstructions. Even though conducting studies online make it possible to reach high numbers of participants all over the world there is a price to be paid for this commodity. Oftentimes it is impossible to assure that the participant feels

fully comfortable with an online study (Foster Thompson & Surface, 2007; Norman et al., 2001). Disruption caused by user interface or similar matters can interfere with the participants' answering process. Additionally, since the data collection process happened remotely, there was also no way for us to check whether the materials presented were engaging enough to our participants. Maybe mere descriptions entailing hints of agency levels and pictures representing people were not enough to convey the manipulations. The idea behind strengthening the agency manipulation is described in the previous section; It is plausible that despite agency manipulation showing significant results, the possibility to make it even more specific and focused should also be considered for future research. Similarly, only having a picture of the final product presented in a life hack alongside its description might not fully present the creativity level of the idea proposed. Moreover, there was absolutely no consequence for participating or not, which might make people feel less accountable for their answers. The option of conducting the study in the lab would be incomparably more desirable if the circumstances were different. However, since this was not a viable possibility for us, we had to resort to the next available substitute. As a result, we might have lost some quality in the gathered data regardless of the most applicable study set-up that was available to us.

Our suggestions for future research include, conducting a similar study in a laboratory environment with supplementary materials such as videos to convey various experimental conditions. This is what Rudman and Glick (1999) did in their experiment to help them portray high and low agency. In this case, it would be easier to portray self-promoting and self-doubting behaviors, making the manipulation stronger and more obvious. This possible alteration could also decrease the likelihood of confusing the idea presenter's level of agency with what might have been interpreted as the assistant's level of agency. This way we would have more assurance that the attribution of characteristics in question is reported for the target

idea presenter specifically. Additionally, we would be minimizing the possible influence of distractors on the focus of the participant allowing them to be more immersed with the experimental environment.

Another limitation is that our sample was rather homogenous, which interferes with generalizability of the results to the rest of the population. Our sample consisted mostly of Dutch and German university students which means that the results can only be confidently generalized to adolescents in higher education coming from these or similar countries.

It surely would also be interesting to measure the effect in more diverse samples such as working adults, adolescents, and possibly even youth to investigate the age differences in creativity evaluations. Also seeing how people from various cultural backgrounds react to creativity displayed by representatives of different genders and varying levels of agency could help us understand if there are cultural factors affecting gender biases.

Moreover, an intriguing addition to experimental conditions would be the gender biases present not only for males and females but also for non-binary presenters. It would be interesting to see how the boundaries on the communality-agency and femininity-masculinity spectrum affect creativity evaluations for people who might not so clear-cut fall into these categories.

Conclusion

To return to Mary's concerns at the beginning of this paper, regarding the board's unfavorable feedback on her presentation, our study investigated the link between gender and creativity evaluation and the role of agency in that relationship. Our results show two important things. First, it was probably not her sex that influenced the board's evaluations of her and James's presentation, which is great news for Mary. Nonetheless, there must have been something that prompted the board to be so critical. We wish we could provide her with more insights into her dilemma but given that we ourselves were left with ambiguous results,

we cannot do that with full certainty. It might be that she will have to take into consideration the context in which she is pitching her ideas because it is possible that our results were not unequivocal due to our creativity presenting everyday solutions. Perhaps with business-related creative solutions there is just more on the line, and for that reason the board wants a more conventional, stereotypically fitting choice of a man in power. We can only be sure, if the future research focuses on exploring the limitations of the creativity judgments theory presented above. For the time being, Mary should try different approaches to presenting herself at work, playing with her take on agency to see what is the most suitable for her. She can also try and dominate female-oriented areas of creative outlet like poetry, art, or fashion, to see if James can outperform her in those situations.

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Table 1*Means and Standard Deviations Across Experimental Conditions*

	Male Idea Presenter		Female Idea Presenter	
	Low agency ($N = 45$)	High agency ($N = 46$)	Low agency ($N = 42$)	High agency ($N = 39$)
Presenter Creativity	3.2 (0.5)	3.4 (0.4)	3.2 (0.6)	3.2 (0.4)
Idea Creativity	3.5 (0.6)	3.7 (0.5)	3.5 (0.5)	3.4 (0.7)
Agency	3.2 (0.4)	3.5 (0.4)	3.2 (0.3)	3.3 (0.3)

Note. $N = 172$ ($n_1 = 91$ for Male Condition (53%) and $n_2 = 81$ for Female Condition (47%)).

Table 2*Correlations and Descriptives Matrix of Main Variables and Additional Variable of Personal Creativity Level of the Participants*

	<i>M</i>	<i>(SD)</i>	1.	2.	3.	4.
1. Presenter Creativity ^a	3.3	(0.5)	.56	.40**	.06	.07
2. Idea Creativity ^b	3.5	(0.6)		.75	.42**	-.09
3. Agency ^c	3.3	(0.4)			.61	.05
4. Personal Creativity ^d	2.8	(0.6)				-

Note. *N* = 172 respondents. Scale reliabilities are given in bold on the diagonal where applicable. **p* < .05. ***p* < .01.

a on a scale from 1 = strongly disagree to 5 = strongly agree

b on a scale from 1 = uncreative attribute to 5 = creative attribute

c on a scale from 1 = strongly disagree to 5 = strongly agree

d on a scale from 1 = not at all like me to 4 = very much like me

p* < .05. *p* < .01.

Table 3

Univariate Two-Way ANOVA Table for Idea Presenter Creativity, Gender of the Idea Presenter, Agency of the Idea Presenter, and Their Interaction

Predictor	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	Partial η^2
(Intercept)	2142.24	1	2142.24	6100.31	<.001	.97
Gender	0.98	1	0.98	2.78	.10	.02
Agency	0.00	1	0.00	0.00	.96	.00
Gender*Agency	0.76	1	0.76	2.15	.14	.01
Error	59.00	168	0.35			

Note. $R^2 = .03$ (Adjusted $R^2 = .01$)

Figure 1

Research Model Between Independent Variables - Gender and Agency, and Dependent Variable - Creativity Evaluation

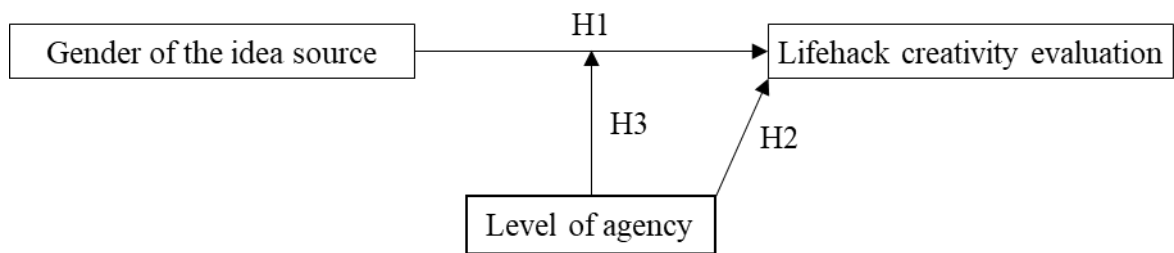
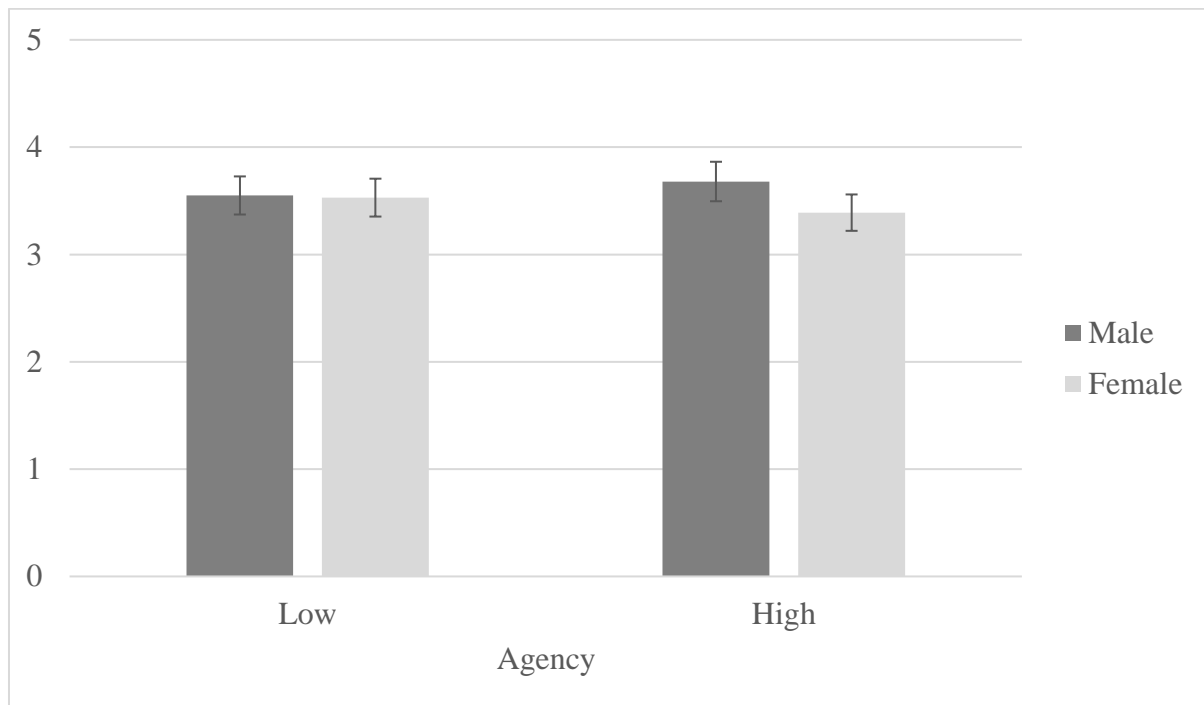


Figure 2

Bar Graph Presenting the Results of the Univariate Two-Way ANOVA Analysis



Appendix A

Study Briefing

In this study, please try to actively imagine yourself in this situation of being a recruiter for the company uNLimited and keep this in mind when reading and answering the questions. uNLimited works with other businesses to provide them with innovative marketing strategies. Part of the recruitment strategy to select the most outstanding candidates is asking them to submit a life hack in form of a blogpost. uNLimited defines life hacks as a simple (and often unexpected) solution for everyday problems. You will be presented with a short blogpost introduction of the candidate alongside the life hack submitted. You will have to rate the life hack and the candidate on numerous attributes, which will help the recruitment process.

Appendix B

Pictures Used for Strengthening the Experimental Manipulation

1. Female Picture (Mary)



2. Male Picture (James)



Appendix C

Blog Post Used for Experimental Manipulation

1. Female (Mary), Low Agency

Hi! My name is Mary, and I am glad to be sharing with you solutions for everyday issues that my assistant recently found and sent to me to post here, on my blog. The tips that you will come across on this blog are unusual ways to fix everyday struggles that I post especially for you. I think that they might make your life easier because I asked my assistant to test them out on my family and friends. Hopefully, once you use these life hacks yourself, you will realize their usefulness. I would also love to hear from you about how this content can be improved for the next time, so please, share your ideas with me in the comments, because your opinion means everything to me. Also, if you have any other issues with something that hasn't yet been written about, please let my assistant know and we will try to find an idea for the next life hack. I hope to hear from you, consider following me on Instagram and TikTok for daily updates and enjoy my suggestions! - Mary, @Marylifehackin

2. Female (Mary), High Agency

Hi! My name is Mary, and I am glad to be sharing with you some clever solutions for everyday issues that I recently came up with. The tips that you will come across on my blog are unusual ways to fix everyday struggles. I am sure that they will make your life so much easier because I tried them out myself and tested them with my family and friends. Once you use these life hacks yourself, you will regret not knowing them earlier. I would also love to hear from you about how they made your life simpler, so go ahead and share your ideas with me in the comments. Also, if you have any other issues with something that I haven't yet written about, please let me know so that I can come up with an idea for the next lifehack. I'm looking forward to hearing what you

have to say, go follow me on Instagram and TikTok for amazing daily updates, and enjoy my ingenious suggestions! – Mary, @Marylifehackin

3. Male (James), Low Agency

Hi! My name is James, and I am glad to be sharing with you solutions for everyday issues that my assistant recently found and sent to me to post here, on my blog. The tips that you will come across on this blog are unusual ways to fix everyday struggles that I post especially for you. I think that they might make your life easier because I asked my assistant to test them out on my family and friends. Hopefully, once you use these life hacks yourself, you will realize their usefulness. I would also love to hear from you about how this content can be improved for the next time, so please, share your ideas with me in the comments, because your opinion means everything to me. Also, if you have any other issues with something that hasn't yet been written about, please let my assistant know and we will try to find an idea for the next life hack. I hope to hear from you, consider following me on Instagram and TikTok for daily updates and enjoy my suggestions! - James, @Jameslifehackin

4. Male (James), High Agency

Hi! My name is James, and I am glad to be sharing with you some clever solutions for everyday issues that I recently came up with. The tips that you will come across on my blog are unusual ways to fix everyday struggles. I am sure that they will make your life so much easier because I tried them out myself and tested them with my family and friends. Once you use these life hacks yourself, you will regret not knowing them earlier. I would also love to hear from you about how they made your life simpler, so go ahead and share your ideas with me in the comments. Also, if you have any other issues with something that I haven't yet written about, please let me know so that I can come up with an idea for the next lifehack. I'm looking forward to hearing what you

have to say, go follow me on Instagram and TikTok for amazing daily updates, and enjoy my ingenious suggestions – James, @Jameslifehackin

Appendix D

Manipulation Checks

1. Q1 Who was the candidate? (Mary, a woman in her 20s/30s; James, a man in his 20s/30s; Luisa, a women in her 40s/50s; Tom, a men in his 40s/50s)
2. Q2 Thinking about the blogpost introduction description, did the candidate get any help in preparing the life hack for the submission? (No, they worked alone; Yes, their assistant helped them; Yes, they worked in a group)
3. Q3 What life hack did the candidate present during their submission? (Vacuum cleaner life hack, Sponge and oil life hack, Screw and rubber band life hack, Clothes folding life hack)
4. The fourth manipulation check was hidden within the questions about the creativity of the life hack, “Please rate the life hack on the following attributes” (Scale (1= feminine, 5= masculine)): Q4 Feminine – Masculine

Appendix E

Questions About the Agency of the Idea Presenter

Scale (1 = strongly disagree, 5 = strongly agree)

[James/Mary] seems like a person who ...

Q1 ... is very self-confident

Q2 ... feels superior

Q3 ... cannot make decisions easily (reverse coded)

Q4 ... is very active

Q5 ... stands up very well under pressure

Q6 ... never gives up easily

Q7 ... is individualistic

Q8 ... is competitive

Q9 ... is independent

Q10 ... is self-sufficient

Q11 ... is autonomous

Appendix F

Questions About the Creativity of Idea Presenter

Scale (1 = strongly disagree, 5 = strongly agree)

[James/Mary] seems like a person who...

Q1 ...thinks 'outside the box'

Q2 ...is creative

Q3 ...has creative potential

Q4 ...is talented

Q5 ...is not gifted (reversed coded)

Appendix G

Questions About Creativity of the Life Hack

Scale (1 = uncreative attribute, 5 = creative attribute)

Please rate the life hack on the following attributes

Q1 Overused - Fresh

Q2 Usual - Unusual

Q3 Unique - Ordinary

Q4 Novel - Predictable

Q5 Illogical - Logical

Q6 Makes sense - Senseless

Q7 Effective - Ineffective

Q8 Functional - Non-functional

MC1 Feminine - Masculine

Q9 Feasible - Infeasible

Q10 Useful - Useless

Appendix H

Questions About the Personality of the Idea Presenter

Scale (1 = strongly disagree, 5 = strongly agree)

[James/Mary] seems like a person who ...

Q1 ... is reserved

Q2 ... is generally trusting

Q3 ... tends to be lazy

Q4 ... is relaxed, handles stress well

Q5 ... has few artistic interests

Q6 ... is outgoing, sociable

AC1 ... please pick agree

Q7 ... tends to find fault with others

Q8 ... does a thorough job

Q9 ... gets nervous easily

Q10 ... has an active imagination