Gender, Hidden Profiles and the Individual Preference Effect

Abstract

In this paper we meta-analysed nine of our own studies to examine gender effects in decision-making when information is asymmetrically distributed amongst group members in a Hidden Profile. In particular, we examined the influence of individual preferences on decision-making outcomes and how, or whether, they differed by gender. The meta-analysis of our studies, which focused on individual decision-making, suggested that the Individual Preference Effect (IPE), a form of confirmation bias, may manifest differently by gender: female participants in the Hidden Profile condition demonstrated greater improvement in decision quality when moving from viewing partial to full information than their male counterparts. No gender differences in decision quality were found when information was presented in a structured one-page Manifest Profile, with all information made immediately available to all participants. This gender differential in the IPE is not contemplated by previous IPE or Hidden Profile research, so this finding is of significant interest. We discuss our results in the context of previous mixed findings regarding the effect of gender diversity in improving group decision-making and potential workplace changes required to recognise this gender difference.

Keywords: Hidden Profile, Individual Preference Effect, Gender, Meta-Analysis

Theoretical Background

Much of the extant literature on gender and decision-making, particularly with regard to Hidden Profiles (Stasser & Titus, 1985), does not seem to fully contemplate the impact of the Individual Preference Effect (IPE: Faulmüller et al., 2010; Greitemeyer & Schulz-Hardt, 2003; Greitemeyer et al., 2003; Mojzisch & Schulz-Hardt, 2010), nor the possibility that this effect may manifest differently by gender. Yet this possibility may offer one explanation for the mixed results achieved for the effect of gender on group decision-making outcomes (e.g. Homberg & Bui, 2013). Against a drive to increase gender diversity on Boards and in organisations (e.g. Cranfield, 2019), we assert that it is important to understand whether, or how, differences in the way the genders approach the decision-making process may manifest. We will begin by briefly recapping the research history of the Hidden Profile and the IPE.

The Hidden Profile and The Individual Preference Effect

The Hidden Profile

There is a long history of group decision-making research using Hidden Profile tasks (Stasser & Titus, 1985). In a Hidden Profile decision task, there is always a 'right' answer, but it is not easily or immediately apparent, due to the fact that information necessary to identify it is distributed asymmetrically between group members: some being shared amongst all members, whilst other information is partially shared or unique, known to only one group member. It is only if groups are successful in both pooling and integrating information, specifically unique information, positive or negative, held by each group member, that they will arrive at the optimal solution. Yet this has proven to be a challenge for groups (see Lu et al., 2012, for a review). To add to the task difficulty, the individual information sets held by each group member typically point to a different decisional outcome than the group's full information set, initially orienting the individual group members towards a suboptimal solution. In short, the presence of unique (hidden) information in Hidden Profile decision

groups creates an immediate information asymmetry between those who hold the information and those who do not, but who could make different – even better - decisions if they had access to that information (Connelly et al., 2011).

Numerous reasons linked to biases and heuristics operating both at the individual group member, and group level, have been advanced for the failure of groups to solve the Hidden Profile. These biases influence what, and how, information is shared. In their comprehensive theoretical analysis, Brodbeck et al. (2007) argued that failures in organizational group decision-making could be counteracted in certain circumstances, thereby enabling groups to outperform individual decision-makers and simple combinations of individual votes. These circumstances require two interacting antecedents: (i) that there are specific types of information asymmetry *in the group*; and (ii) that specific types of asymmetries in information processing are *absent from the group*. Brodbeck et al. (2007) identified theses information processing asymmetries as: (i) negotiation focus; and (ii) discussion bias, both operating at the group level of information processing; and (iii) evaluation bias, operating at the individual group member processing level. Negotiation focused processing leads group members to share only information that will help them identify and achieve the majority group verdict. The individual (suboptimal) preferences and opinions form the basis for the information shared (Gigone & Hastie, 1997) and the emphasis during the group discussion is on shared information supporting those preferences (i.e. discussion bias, see Larson et al., 1996). At the level of the individual group member, evaluation bias leads to group members favouring shared, preference consistent information (Brodbeck et al., 2007). Group members also value shared information, (Greitemeyer et al., 2003), largely because it offers social validation, as it can be corroborated by others (Wittenbaum et al., 1999). Finally, individual group members evaluate information consistent with their personal opinions as more credible (Greitemeyer & Schulz-Hardt, 2003).

The Individual Preference Effect

The Individual Preference Effect: (IPE: Faulmüller et al., 2010; Greitemeyer & Schulz-Hardt, 2003; Greitemeyer, et al., 2003; Mojzisch & Schulz-Hardt, 2010), a form of confirmation bias, offers a supplementary but powerful explanation for groups' decision-making failures in Hidden Profile tasks. The effect of the IPE is such that individual group members are unable to amend their initial suboptimal selection decision and remain committed to this, even when presented with full information enabling them to make the correction. The IPE has been identified as a significant contributing factor to groups' failures to solve Hidden Profile tasks: comparisons against real interacting groups suggested almost half of all groups would fail to solve the Hidden Profile, even when all information was exchanged and no co-ordination losses occurred, as a consequence of the IPE (Faulmüller et al., 2010). Furthermore, in the absence of an initial preference exchange, other studies have found evidence of improved group decision quality. For example, Schulz-Hardt and Mojzisch (2012) found that only 22% of groups with initial preference exchange solved an HP versus 55% of groups with no preference exchange.

Extant research suggests that the IPE is largely driven by preference consistent evaluation of information. Greitemeyer and Schulz-Hardt (2003) found that the IPE was at least partially mediated by the biased evaluation of the importance and valence of information supporting the individual group members' initial suboptimal selection. Despite the fact that negative attributes of the initially preferred suboptimal selection may emerge during the group discussion, these are discounted. Instead, individual group members remain focused on the positive attributes of their initial suboptimal selection, which significantly increases the threshold difficulty for solving the Hidden Profile.

Faulmüller et al. (2010) speculated that one possible reason for the IPE was differing amounts of cognitive resources being allocated to the processing of preference consistent

versus inconsistent information: preference consistent information matches with prior beliefs, thus there is no need to challenge it and it can be accepted easily and quickly. Conversely, information which is not congruent with prior beliefs requires more cognitive resources to examine it, making the acceptance process much more difficult.

Gender Differences in Decision-Making: Overview

Research has long suggested that men and women differ in their approaches to decision-making. Stereotypical views point out that men are rational and analytic in their approach, whilst women are more intuitive (see Delaney et al., 2015 for a discussion). A popular test of decision-making processes is the Cognitive Reflection Test (CRT: Frederick, 2005), a three-item test designed to measure an individual's ability to override an initial incorrect response and to engage in more detailed and further reflection, required in order to achieve the correct response. An example of an item from the CRT is "A bat and a ball cost $1.10 in total. The bat costs a dollar more than the ball. How much does the ball cost? ___ cents" [Correct answer = 5 cents; intuitive answer = 10 cents]. Supporting the classic gender stereotype, Frederick and colleagues found that men performed significantly better than women on the CRT: results suggested men were more likely than women to reflect on their answers and less inclined to go with their intuitive responses.

In a study designed to extend the three-item CRT into a seven-item scale, Toplak et al. (2014a) replicated the gender effect found by Frederick (2005) in the original three-item CRT and in the four new items, where men again significantly outperformed women. Effect sizes (Cohen's *d*) for the original three items and the new four items were very similar at .637 and .652 respectively, indicating a medium to large effect. Extrapolating these findings to the potential impact of the IPE in the Hidden Profile, we observe certain similarities to the CRT. The first response in a typical Hidden Profile task, (i.e. selecting the suboptimal solution), happens quickly and occurs before all information has been considered. Overcoming that first

response and integrating the additional information in order to correct and pivot to the optimal solution, requires proper reflection on, and integration of, new, decision-disconfirming information. Frederick's and Toplak et al.'s findings with respect to the CRT could point to a possible gender difference in the IPE, such that men will be less affected than women by the IPE and demonstrate improved decision quality by 'overcoming' the IPE. We will return to a discussion of gender differences in the various steps of decision-making below.

This meta-analysis of our nine studies examines whether previously identified gender differences in information processing, information use and decision-making confidence may help us to understand whether, or how, male and female decision-makers are affected differently by the IPE and consider the organizational impact of this. For example, whether workplace adjustments should be contemplated, such as changes to group decision-making processes and procedures, in order to account for this possibility.

Confidence in Decision-Making

In his taxonomy of 37 biases, Arnott (2006) highlighted *confidence biases*, as particularly damaging, since they increase a person's belief in their own ability as a decision-maker and also curtail the search for new information relating to the decision task. Four key causes of overconfidence were identified by Russo and Schoemaker (1992): (i) *availability*: people have difficulty in managing all of the ways that events might unfold; (ii) *anchoring*: a tendency to anchor on one value or idea and be unable to shift away from it; (iii) *confirmation bias*: seeking evidence to confirm our initial view, rather than that which disconfirms it; and (iv) *hindsight*: we believe events are more predictable than they really are. The structure of Hidden Profiles and, specifically, the impact of the IPE, link clearly to these biases. The effect of the IPE is such that the decision-maker anchors on the initial preference, then both seeks *and* shares information which confirms, rather than disconfirms, that initial

preference. This also makes it more difficult for the decision-maker to contemplate the possibility (likelihood) that their initial preference might, in fact, be suboptimal. This leads us to assert that confidence may play an important role in the IPE.

Overcoming the Hidden Profile

Interventions to improve decision-making performance in Hidden Profiles have met with mixed success. On the one hand, varying the amount of information shared, or the group size, have shown no real effect (Stewart, Billings, & Stasser, 1998). Decision-making training and the introduction of artificial dissent improved information sharing, but not decision-making outcomes (Greitemeyer et al., 2006: Larson et al., 1994). Forced rank-ordering of the alternatives (e.g. Hollingshead, 1996), and interventions founded on counterfactual thinking and mental simulation, were successful in improving *both* information sharing and decision-making outcomes (Galinsky & Kray, 2004; Nicholson et al., 2020; Nicholson et al., 2021). Overall, however, the task's stubbornness to attempted solutions and interventions means that the Hidden Profile and the IPE remain an important area of decision-making research.

Gender Differences in Decision-Making: Detailed Background

Information Processing

Byrne and Worthy (2015) set up a dynamic decision-making task to examine gender differences in reward sensitivity and information processing. In Study 1, the optimal strategy was to forgo one option offering immediate and larger rewards in favour of one offering larger but delayed rewards. In Study 2, the optimal strategy was reversed, so that the selection of the larger, immediate rewards was optimal. Results showed male participants were more likely to perform better than females in the first task. Conversely, females outperformed males in the second task. Byrne and Worthy attributed this to gender differences in decision-making as a consequence of different information processing styles, positing that females are more comprehensive processors of information, able to maximize

either immediate or long-term benefits in different situations, whilst males process information more selectively, and demonstrate a cognitive bias towards maximizing long-term benefits.

Building on this, research into the differing effects of advertising on the genders suggests males and females have very different processing styles. Meyers-Levy and colleagues (Meyers-Levy & Maheswaran, 1991; Meyers-Levy & Sternthal, 1991) examined gender differences in responses to advertising messages and developed the "selectivity theory". This highlighted differences in information processing between the genders: females engage in more detailed elaboration of message content and more detailed processing. By contrast, male processing is more selective, focused on the overall message themes, and deploys a schema-based strategy. This finding was empirically supported by Darley and Smith (1995) in a study using a product purchase task. Findings showed that not only were females comprehensive processors, more likely to consider both objective and subjective aspects of product purchase and use, but they were also more likely to change their processing strategy in response to increased product risk. By contrast, males did not change their processing strategy, as a consequence of their reliance on highly available and salient focal cues. Meyers-Levy and Sternthal attributed these differences to women having a lower elaboration threshold around message cues than their male counterparts. Women were much more likely to engage in deeper elaboration at lower thresholds than men, particularly when faced with more incongruent cues – that is, those more at odds with the 'typical' thrust of the message/content. This made them more able to apply these cues in reaching their judgments. Applying this to the current research, overcoming the IPE (and setting up to successfully solve the Hidden Profile) requires a cognitive shift from participants when they move from viewing information which is – deliberately - highly favouring of a suboptimal solution to viewing all information, which contains not only information favouring an *alternative*

solution, but information which should also cause them to positively reject the initially favoured solution. If women are more able to engage with incongruent cues, this may suggest they have an advantage over their male counterparts in overcoming the IPE.

Information Use

These processing differences also have implications for how the two genders approach and utilise information they are presented with. Chung and Monroe (1998) compared the performance of male and female accounting students in an evaluation task containing equal numbers of confirming and disconfirming cues: students were required to rate the importance of the cues to their hypothesis. Results from the study supported Chung and Monroe's prediction that male students were significantly more likely to ignore disconfirming information and were more hypothesis-confirming than their female counterparts, although they did not rate confirming evidence as more important than female students, nor did they assign more importance to confirming information.

One implication of a failure to account for disconfirming information is that solutions can be arrived at too quickly, before all information has been properly considered, resulting in suboptimal outcomes. This is consistent with the findings from extant Hidden Profile research, suggesting that group members actively seek out preference-consistent information which best aligns with their (suboptimal) pre-discussion selections. For example, Reimer et al. (2007) found that group members failed to integrate information contradicting their pre-discussion preferences.

In a follow up study, Chung and Monroe (2001) linked their earlier research finding to task complexity, noting that females become more efficient relative to males as information load and task complexity increases. They attributed this finding to females' greater ability to process multiple or inconsistent/incongruent cues, make finer distinctions between cues, as well as their better ability to recall and integrate cues. Using an audit-based

review task, Chung and Monroe found that male students made less accurate judgments as task complexity increased. Conversely, female students' judgments were not significantly affected by additional information, even when much of it was incongruent or inconsistent. In a typical Hidden Profile paradigm, participants are presented with additional information following their initial suboptimal selection (based on only partial information) and need to integrate this in order to successfully correct their decision. Chung and Monroe's findings suggest female participants may outperform their male counterparts in overcoming the effect of the IPE, by evidencing more ability to correct their initial suboptimal decision in favour of the optimal one, once all relevant information is revealed.

Task and Decision Confidence

A further factor to consider in this analysis of gender differences in decision-making is whether task and decision confidence varies in male and females and, if so, how this may manifest itself in the presentation of gender differences in the IPE. For example, one explanation for these differences in decision-making may be differing levels of confidence between the genders in their initial decision.

In a review of gender differences in economic experiments, Croson and Gneezy (2009) noted that, whilst both men and women were overconfident, men were more overconfident in their success in situations of uncertainty compared to women. In investment decisions, they noted that women were almost always less confident than men. Similarly, they noted that research suggests men display substantially more confidence with respect to their relative task performance (e.g. in mathematical problems) than women. There is further support for this elsewhere in the literature. For example, Kelley and Lemke (2015) used an analysis of a television game show involving a decision task ('Cash Cab') to demonstrate that, whilst women considered all information available to them, including poor plays and good plays, men appeared unduly influenced by their overall confident good play. They also

noted that women appeared less confident than men, even in their correct answers. This finding is consistent with research into gender differences using the Iowa Gambling Task, a task used to study decision-making processes in conditions of uncertainty. The task is to earn as much money as possible: two decks offer long-term losses but the chance of big immediate rewards. The two other decks will win in the long-term but offer an immediate smaller award. Van den Bos et al. (2013) found that women focused on win-loss frequencies and were more sensitive to occasional losses in the longer-term winning decks than their male counterparts. Applying this to the Hidden Profile, the confidence of male participants in their initial decision may be inordinately boosted by the influence of the positive attributes of the initial, suboptimal solution. By contrast, women may be less confident if they are more influenced by the negative attributes of the initial suboptimal solution. Understanding whether decision confidence differs by gender will enable us to create better working processes for mixed-gender decision-making groups, and to create shared 'decision spaces' which recognise those confidence differences.

Overview and Hypotheses

Goh et al. (2016) set out a series of arguments for conducting meta-analysis on one's own studies including the ability to: (i) focus on effect sizes; (ii) clarify the results picture; (iii) offer a succinct summary of the results across studies; and (iv) leverage the statistical power provided by a meta-analysis. Accordingly, this paper seeks to further examine the possibility of a gender differential in the IPE through meta-analysing the results of five of our own individual online studies: (See Table 1 for full participant details). Five of these primary studies, examining individual decision-making in a specially designed Hidden Profile paradigm occurred over a roughly 20-month period, using participants drawn from Prolific

Academic.[1] Two studies took place in April 2020 and included only a Hidden Profile condition. Two studies took place in March 2021 and included both Hidden and Manifest Profile conditions. These four studies also utilised the specially designed online Hidden Profile paradigm.

Results from the individual online studies suggested that, in contrast to their male counterparts, female participants in the Hidden Profile condition demonstrated improved decision quality. Specifically, female participants were more able to correct their initial suboptimal candidate selection decision, based on partial information, when all candidate attribute information was subsequently made available to them. However, across the nine online studies, results for these gender differences on decision quality were inconsistent, derived from small samples, creating concerns around power. Adopting the arguments of Goh et al. (2016), we therefore resolved to address these concerns by meta-analysing the results of the five studies on this decision quality measure and several other relevant measures, including: (i) mean confidence in the Optimal (A) and (ii) Suboptimal (C) Candidates (see Procedure below); (iii) overall confidence in selection decision; and (iv) difficulty in changing the selection decision. Based on extant literature in gender differences in decision-making, we hypothesized the following:

H1: Female participants will be better able to overcome the IPE and demonstrate more improved decision-making than their male counterparts having viewed full candidate attribute information.

H2: Female participants will be more confident in the Optimal Candidate (A) than their male counterparts having viewed full candidate attribute information.

[1] Certain data from Studies 2 & 5 were included into a paper published elsewhere (Nicholson, Hopthrow, Randsley De Moura, 2020 – *International Journal of Organization Theory and Behavior*) but did not incorporate any analysis of differences derived from participant gender. Our meta-analysis represents a re-analysis of this data, focusing on differences in participant gender. Data and results from Studies 1, 3-4, 6-9 are unpublished.

H3: Female participants will be less confident in the Suboptimal Candidate (C) than their male counterparts having viewed full candidate attribute information.

H4: Female participants will report lower overall confidence in their candidate selection decision compared to their male counterparts having viewed full candidate attribute information.

H5: Female participants will report less difficulty in correcting and amending their candidate selection decision than their male counterparts, having viewed full candidate attribute information.

Method

The Studies

Studies for this meta-analysis include:

1) Three online individual studies examining the Individual Preference Effect. (Included both Manifest and Hidden Profile conditions).

2) Two online individual studies expanding on this to explore whether manipulating the gender of Candidates A, B and C had any effect on decision-quality in Manifest (see below) and Hidden Profile conditions. The candidate gender manipulation was found to have no effect in the two studies mentioned, so this variable was collapsed. (Included both Manifest and Hidden Profile conditions).

3) Two online individual studies exploring whether a competition versus collaboration manipulation had any effect on decision quality in a Hidden Profile condition only. The manipulation was found to have no effect in both studies, so this variable was collapsed. (Included Hidden Profile condition only).

4) Two online individual studies exploring the Individual Preference Effect alongside a range of personality measures. (Included Manifest and Hidden Profile conditions).

All studies used a specially designed and tested online Hidden Profile paradigm as noted (Nicholson et al., 2020).

Participants and Design

Participants were recruited from Prolific Academic and took part in the experiment in return for a small monetary payment. Table 1 reports details of numbers of participants split by gender and including Mean age, across all nine studies, for the Manifest and Hidden Profile conditions. All studies stipulated that participants should be a minimum age of 18. (Participant age differences were subject to meta-analysis, revealing a non-significant difference, $p = .26$, Cohen's d = 0.14. In addition, binary logistic regression conducted on each primary study did not reveal age to be a significant predictor of decision quality). Participants were prevented by the software from taking part in more than one study. For the fifth study, a further participant criterion was added, which specified that participants needed to be engaged in full-time employment - although we did not specify participants in the earlier or later studies *did not* need to be in full-time employment.

The design of Study 1 was a mixed 3 (Information Condition: Manifest Profile (MP) *vs.* Hidden Profile (HP) *vs.* No Preference (NP)) X 2 (2) (Time: Initial Decision Point, Final Decision Point) experimental design, with Decision Point as the within participants factor, only in the HP Condition (as per Faulmüller et al., 2010, Study 2); our experimental goals did not require group conditions. Studies 2-9 excluded the No Preference condition, as we were interested in results for participants in the Manifest and Hidden Profile conditions only. Specifically, we are comparing gender decision quality (and the other measures) for participants in the Hidden Profile condition, with the aim of increasing our understanding of the impact of the IPE.

Study Methodology

We provide below a detailed description of the methodology for the first study. As noted, subsequent studies replicated this design, with the exclusion of the No Preference (NP) condition, as our focus was on the results for participants in the Manifest/Hidden Profile conditions.

Materials

The HP decision task material was adapted from Baker's (2010) group activity: participants were asked to choose between three candidates – (A), (B) and (C) - for the position of president of a new campus of a university. The Candidates were identified only by these letters to avoid irrelevant assumptions about gender associated with surnames. All participants received a brief description of the job and key selection criteria. Each candidate had 16 items of information drawn from interviews, references, personal observations, etc., typical of a real hiring scenario. Full information described Candidate (A) as the optimal candidate for the role with eight favourable, four neutral and four unfavourable characteristics; Candidates (B) and (C) each had four favourable, eight neutral, and four unfavourable characteristics. All participants received full information on each candidate before making their final choice, but the form of the initial information distribution varied by condition (see Procedure below and Appendices I and II).

Procedure

The experiment was delivered online in a tool designed to induce the Individual Preference Effect (Nicholson et al., 2020). The survey software randomly allocated participants to condition, who then provided informed consent within the software and completed the items in their own time, in any location with internet access. Participants were told they were being asked to work on a personnel selection task and were required to choose their preferred candidate to be awarded the role from three shortlisted candidates. All

participants were also told they were working as part of a four-person virtual group and that at some point they would see not only their own information but also that of their fellow group members (in reality there was no virtual group, but candidate information, which was either presented on one page or distributed across four separate sheets, was presented to participants in all conditions as information of their 'fellow group members' – adapted from Faulmüller et al., 2010, Study 2). Participants were also told that one candidate was better suited to the job than the others and that their own information was either identical, or not necessarily identical (depending on randomly allocated condition), to their fellow (fictitious) group members. Experimental conditions differed in the distribution of candidate information items between participants, as described below.

Manifest profile (MP).

Participants in the MP condition viewed a one-page list setting out full candidate information in bullet form, beginning with information about Candidate (A), then (B), then (C) (Appendix I). This list contained every piece of information once, with no repetitions (as per Faulmüller et al., 2010, Study 2). Participants were told their information was identical to their fellow, (fictitious) group members and asked to make one individual candidate selection decision based on the information held by them (T1). Candidate (A) was shown as the Optimal Candidate, with the candidate attribute list reflecting eight positive, four negative and four neutral attributes. There were no differences between Candidates (B) and (C) on this list (each had four positive, four negative and eight neutral attributes).

Hidden profile (HP).

Participants in the HP condition firstly made an initial selection, based on viewing partial candidate information on only one single list, either W, X, Y, Z (Appendix II: presentation of the lists was randomized). Each list began with information about Candidate (A), then (B), then (C). Presentation of an initial single list constituted the Suboptimal

Candidate manipulation, since each list oriented participants towards Candidate (C) as the 'best' candidate, with four positive, one negative and two neutral attributes. Candidate (B) was presented as the second-best candidate on each list, with four positive, four negative and two neutral attributes. Attributes for the Optimal Candidate (A) were presented in a Hidden Profile: each list presented two positive, four negative and one neutral attribute of Candidate (A). On the face of it, Candidate (A) therefore initially appeared to be the worst candidate to those participants in the HP condition. Some candidate information constituted 'shared', appearing on all lists; some was 'unique', appearing only once on the four lists (Appendix II). After making an initial selection, Hidden Profile participants then viewed their own information again, plus the information of their 'fellow group members' (they were told this information was not necessarily the same) – all lists W, X, Y Z (presentation was randomized) - and were asked to review their candidate selection, specifically whether they wanted to maintain or change that selection. This constituted their final decision point. Participants in the HP condition therefore saw their own information repeated, plus the information of their fictitious group members. Taken together, the four lists comprised full information on each candidate. As in Faulmüller et al. (2010), this is the psychological equivalent of a group member experiencing perfect information exchange in a 'real' HP group: the individual participant firstly has their own pre-discussion information, which can then be paired with all candidate attributes held by other fictitious group members through viewing all four lists.

No preference (NP) – Study 1 only.

Participants in the NP condition made one individual candidate selection decision, based on information held by them and their fictitious group members. They were told this information was not necessarily the same. Participants simultaneously viewed the same four lists as participants in the HP Condition; presentation of the four lists was rotated. Since there

was no initial presentation of a single list and subsequent decision, as in the HP Condition, there was no initial Suboptimal Candidate manipulation. Participants in both the NP/HP conditions should be able to identify Candidate (A) as the Optimal Candidate only by successfully integrating candidate attribute information from all four lists.

Following Faulmüller et al. (2010), the NP condition sought to disentangle to what degree any difference in the frequency with which the Suboptimal Candidate (C) was selected in the NP/HP conditions was attributable to the IPE, rather than information supporting the participants' initial preferences appearing on all four information lists. We expected the initial presentation of a single list to participants in the HP condition would induce the Individual Preference Effect, leading to the Suboptimal Candidate (C) being more frequently selected at T2 by participants in the Hidden Profile condition versus either the MP/NP conditions. (Results from Study 1, not reported here, confirmed this).

Measures

The following measures were subject to meta-analysis:

Decision Quality

Decision quality was a dichotomous measure, based on whether participants selected the Optimal Candidate (A) (coded 1) or a Suboptimal Candidate (coded 0).

Participant Confidence in Suboptimal/Optimal Candidate

The second dependent variable was participant confidence in the Candidates. Following their candidate selection, participants were asked to record their level of confidence in each candidate for the job by responding to the statement "*I think Candidate A/B/C would be the best person for the job*", on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). This measure was not included in Faulmüller et al.'s (2010) study but we consider it an important addition to understand how the IPE may affect participant confidence levels in the Optimal and Suboptimal candidates.

Participant Confidence in Selection Decision

The third dependent variable asked participants to measure the level of their overall confidence in their selection decision, by responding to the statement "I am confident in my selection decision" on a 7-point Likert scale (1 = *strongly agree* to 7 = *strongly disagree*).

Participant Difficulty in Changing Selection Decision

Participants in the Hidden Profile condition were asked how difficult they found it to change their selection decision from their T1 initial choice, based on partial information only, which oriented them towards the Suboptimal Candidate (C), followed by viewing full information spread across all four lists. After making their second decision, participants were asked to respond to the statement "I found it difficult to change my selection decision" on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree.* The mid-point – 4 was *"I did not change my selection decision"*).

Hidden Profile Meta-Analyses

The focus of the meta-analysis of our studies is comparing male and female participants performance in the Hidden Profile condition across the nine studies. For completeness, we have also reported the results of a meta-analysis of gender differences for male and female participants in the Manifest Profile condition (Lavery et al., 1999) across seven of the nine studies (two studies did not have a Manifest Profile condition). Results for participants in this condition effectively act as a "Control", although in the Manifest Profile condition there is only one decision point, occurring after participants have viewed a one-page list containing full candidate attribute information for all three candidates. Accordingly, the meta-analysis of participants in the Manifest Profile condition reports gender differences based on: (i) decision-quality (whether or not the Optimal Candidate (A) was selected); (ii) participant confidence in the Optimal Candidate (A); (iii) participant confidence in the Suboptimal Candidate (C); and (iv) participant overall confidence levels in their candidate

selection decision. To clarify, we are not comparing performance between Manifest and Hidden Profile conditions in these studies, but by presenting both sets of results, we demonstrate that when male and females are presented with information in the form of a one-page structured Manifest Profile, no gender differences emerge. However, when information is presented in the Hidden Profile format, our results suggest gender differences *do* emerge.

In summary, results from both conditions are included in this meta-analytic study to examine the performance of male and female participants in: (i) the Hidden Profile condition, where participants are presented initially with partial information favouring a Suboptimal Candidate (C) (thereby inducing the IPE); (ii) the Manifest Profile condition, where all candidate attribute information is immediately available, presented on one-page.

Meta-Analytic Software

The meta-analyses effect sizes were calculated using 'Meta-Essentials' (version 1.1) [Excel spreadsheet] (Suurmond et al., 2017). This is a set of Excel spreadsheet workbooks which is free to use and which can be downloaded from an accompanying website (www.meta-essentials.com) together with an accompanying user manual (Van Rhee et al., 2015). Both the workbooks and the manual are licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. The seven workbooks comprise one generic workbook, calculating effect size data; three workbooks related to the *d*-family, calculating odds ratio/risk ratios or risk difference and standardized mean difference: Cohen's *d* or Hedges' *g*; and three workbooks relating to the *r*-family, calculating the zero-order correlation coefficient, partial and semi-partial correlation coefficients. These workbooks have been extensively validated by the authors against a range of other meta-analytic packages (see Suurmond et al., 2017 for a discussion and details of published meta-analyses using Meta-Essentials). All results were obtained from random-effect models, with the usual assumptions, that is, that observed effect sizes are drawn from a population of

studies with varying effect sizes. Results were interpreted using Cohen's (1988) guidelines for small (d = 0.20), medium (d = 0.50) and large ($d \geq 0.80$) effect sizes. For the decision quality gender difference comparison (Effect Size 1), involving dichotomous variables, test statistics were converted into odds ratio.

Results

Following the analytic approach of Faulmüller et al. (2010, Study 1) and Toma et al. (2013, Study 1), participants in the HP Condition who failed the first HP suboptimal candidate manipulation, i.e. they did not select Candidate (C), the intended initial preference, were excluded from the analysis. Faulmüller et al. noted ". . .participants whose prediscussion choice differed from the preference induced were excluded from all analyses. This seems appropriate since we are interested in the conditions under which participants are unable to give up their suboptimal prediscussion preference, when faced with full information" (p. 659). Toma et al. excluded five and two participants from their Study 1 and Study 2 results respectively because they did not choose the intended initial preference (p.48-9). Greitemeyer and Schulz-Hardt (2003) made similar exclusions (p. 328, 329) in examining two variables in their study ('Evaluation of Information' and 'Information Recall'). Given our focus on the IPE, we have taken an identical approach (see Table 1 for numbers of participants (split by gender) in the Hidden Profile condition pre and post this exclusion). This subset of the data was used for all hypothesis testing in the Hidden Profile condition.

All results for the comparison of male and female participants in the Hidden Profile condition are summarised in Table 2 and reported below[2]. For Hypotheses 1-4 in the Manifest Profile condition, the data did not reveal any significant gender differences (see Table 3). (Please note that since there is only one decision point in the Manifest Profile

[2] For completeness, we have also included Table 2a which reflects all participants in the Hidden Profile condition, i.e. without the exclusion of those participants who did not select the initially intended preference.

condition, the decision quality comparison in this condition is simply whether male/female participants chose the correct candidate (Candidate A) at the single decision point).

Effect Size 1: Gender Difference in Decision Quality

H1 expected that female participants in the Hidden Profile condition would be better able to 'overcome' the IPE and demonstrate more improved decision-making than their male counterparts, after viewing full candidate attribute information. The data supported this. The odds ratio of 0.56 was significant (p = .017) and indicated that female participants were approximately 56% more likely than male participants to correct their initial suboptimal candidate selection decision after viewing all candidate attribute information.

Effect Size 2: Gender Difference in Confidence in Optimal Candidate (A)

H2 expected female participants to be more confident in the Optimal Candidate (A) than their male counterparts, having viewed full candidate attribute information. The data did not support this: there were no significant differences between the genders in confidence levels in the Optimal Candidate (A) in the Hidden Profile condition.

Effect Size 3: Gender Difference in Confidence in Suboptimal Candidate (C)

H3 expected female participants in the Hidden Profile condition to be less confident in the Suboptimal Candidate (C) than their male counterparts, having viewed full candidate attribute information. The data did not support this: there were no significant differences between the genders in confidence levels in the Optimal Candidate (C) in the Hidden Profile condition.

Effect Size 4: Gender Difference in Confidence in Selection Decision

H4 expected female participants in the Hidden Profile condition to report lower overall confidence in their candidate selection decision compared to their male counterparts after viewing full candidate attribute information. The data supported his: female participants in the Hidden Profile condition were less confident in their overall selection decision after

viewing full information when compared to their male counterparts, $p < .001$, Cohen's d = 0.20, a small/medium effect size.

Effect Size 5: Gender Difference in Changing Selection Decision

H5 expected female participants would report less difficulty in revising their candidate selection decision than their male counterparts, having viewed full candidate attribute information. The data did not support this: there were no significant differences reported between the genders in changing their selection decision.

Discussion

This meta-analysis of our nine online individual decision-making studies provides empirical evidence, for the first time, that the Individual Preference Effect, an important factor in groups' failures to solve Hidden Profile decision tasks, may manifest differently by gender. A key point to note, and one which supports our argument, is that an accompanying meta-analysis of gender differences of participants in the structured one-page Manifest Profile condition on the same variables found no significant differences between male and female participants. Confronted with all candidate attributes on a structured one-page sheet of information, with no IPE induced, male and female participants made very similar selection decisions and reported the same levels of confidence in the Optimal/Suboptimal candidates, and their overall selection decision. The position was different, however, for participants in the Hidden Profile condition, where the IPE was induced.

Decision Quality

Female participants displayed improved decision quality, seeming to more able to correct and pivot from their initial Suboptimal Candidate (C) selection decision than their male counterparts, after viewing full candidate information. Male participants reported greater difficulty in switching their candidate selection decision and, consistent with this, their decision quality, as evidenced in this particular task, was inferior to female participants.

This result suggests female participants were more able than male participants to integrate new information relating to the candidates when presented with all four sheets (W, X, Y Z) and apply this in order to correct their initial suboptimal decision, thereby overcoming the IPE. This result also suggests that when information is incomplete, women may be more likely to look at all of the information when they are given it. In a Manifest Profile, with full information available at beginning, there is little incentive for a participant to change their opinion, even if it becomes clear that the subsequent decision outcome is suboptimal. After all, imperfect decisions can be made, even when full information is available. But it may also be the case that making a poor decision on the basis of full, rather than partial information, is easier to self-justify.

Female participants were more likely to switch their selection to the Optimal Candidate (A), having viewed full information, when compared to their male counterparts, although the fact that there was no significant difference between the genders in confidence in the Optimal Candidate (A) suggests that some degree of caution in interpreting this result is necessary. This parallels the findings of Chung and Monroe (1988), that male accounting students exhibited greater confirmatory behaviour as a result of ignoring disconfirming evidence and were more 'hypothesis-confirming' than their female counterparts, although given the structure of our primary studies, we are unable to fully assert this. Future research could test this by asking participants to rate the importance of each candidate attribute to their decision on a Likert-type scale following their final selection decision, to ascertain which were given the greatest weighting.

Decision Confidence

As discussed above, confidence has also been shown to be an important factor in decision-making and also to differ between the genders in their decision-making processes (Croson & Gneeezy, 2009; Kelley & Lemke, 2015). There was no difference between the

genders in confidence in the Optimal Candidate (A), and the Suboptimal Candidate (C) after viewing full candidate information. However, female participants reported lower overall confidence in their selection decision, compared to their male counterparts. A 'popular' suggestion of recent years is the existence of a "confidence gap" between men and women in the workplace, where the latter are seen as less confident than men in their abilities. This is often pointed to as one reason for women's seemingly lower attainment levels in, for example, promotions, leadership roles and pay increases. That said, alternative perspectives have suggested no differences in confidence exist between the genders and other explanations (e.g. women's fear of "backlash") have been put forward as one reason for lower attainment (Thomson, 2018). Given that our data suggests differences between the genders in their overall confidence levels, there may indeed be some merit in the explanation of the "confidence gap", although the relationship between this and decision quality is less clear.

Information Integration

Byrne and Worthy (2015) noted that as selective processors, males perform worse when integrating multiple sources of information. Conversely, females are comprehensive processors and rely on multiple sources of information. The Hidden Profile is a task which relies on multiple sources of information: participants are initially asked to make a decision based on a small amount of information, then review that decision on the basis of a much larger amount of information. In our online paradigm, the multiple sources of information are represented by the four candidate attribute sheets (W, X, Y, Z) viewed by participants in the Hidden Profile condition. Research evidence would therefore suggest females should outperform males in overcoming the IPE, which the findings here support.

Meyers-Levy (1989) also suggested that male decisions may be more affected by a 'primacy bias', whereas females' decisions have more of a 'recency bias'. With respect to these studies, this would suggest that male participants should find it more difficult to 'shake

off' the effect of the IPE, since they would be more biased towards the initial information viewed, on which they based their suboptimal decision. By contrast, female participants should be more influenced by the larger, complete information set, which was viewed last. Again, this is consistent with our results here. Adding a participant recall task to the study, following the final selection decision could allow us to ascertain the candidate attributes that continued to resonate most strongly with participants, providing a rationale for their candidate selection decision.

Yet, further research suggests something more complicated may be going on than may at first appear. Toplak et al. (2017) found that males outperformed females on a heuristics and biases composite and endorsed more actively open-minded thinking than females. Notwithstanding, Delaney et al. (2015) undertook cluster analysis to examine differing styles of decision-making and found that women were 37% less likely than men to be in the "affective/experiential" mode of decision-making, where decisions are made quickly, often based on gut feelings and experience. This seems to be at odds with the findings of Toplak et al. This has led some to speculate that gender differences in decision-making are more about the behavioural styles/demands of gendered social roles than any difference in intellectual competency (e.g. De Acedo Lizarraga et al., 2007).

As noted, (p. 22) for completeness, we have also included analysis (Table 2a) which reflects all participants in the Hidden Profile condition, i.e. without the exclusion of those participants who did not select the initially intended preference – that is, where the IPE was not induced. The decision quality result remained, as did the overall confidence result – albeit with a small effect size. Of course, examining the result without the exclusion of participants who did not select the initial intended candidate, does not permit us to assert that female participants appear more able than their male counterparts to overcome the Individual Preference Effect (IPE). It merely allows us to state that, whilst there are no gender

differences in decision quality at Time 1, the women in our studies made superior decisions at Time 2. This is reflected in the revised wording to Hypothesis 1 in Table 2(a), which excludes the reference to the IPE.

Limitations and Future Research

A first limitation of these findings is that the meta-analytic effect size for the gender difference in Overall Confidence was in the small to medium range. More primary studies should be carried out in this area, examining these gender differences, with greater sample sizes, to test whether these findings can be replicated consistently in primary studies. This will help to increase our understanding of potential gender differences in decision-making and how these may manifest themselves in an individual, face-to-face group, or virtual environment. It will also enable us to test for boundary conditions and whether situational factors (e.g. group composition, task type) can attenuate or amplify these differences.

We also recognise a second limitation around the study stimuli, which is that the same Hidden Profile task material was used throughout all studies. Furthermore, in the Hidden Profile condition, participants were randomly presented with list W/X/Y/Z at Time 1. At Time 2, they were presented with all four lists, with the ordering of the lists randomised. We did not, however, change the ordering of the presentation of the candidates in either the Hidden Profile or Manifest Profile conditions: the lists were consistently presented as Candidate A/B/C. Nor did we re-order the presentation of any of the individual candidate attributes. That said, to make the meta-analysis meaningful, it was advantageous to have identical stimuli across the studies. Notwithstanding, future studies should therefore examine potential gender differences using alternative Hidden Profile decision-tasks. In addition, if this same decision task is used in future studies, then these studies should randomise the presentation of the candidates on the lists, for example, candidates could be presented as C/B/A or B/A/C). Finally, the ordering of individual candidate attributes within each list

could also be randomised, whilst maintaining the integrity of the approach used to induce the Individual Preference Effect.

With respect to group composition, a further area for future research may be the role of influence in mixed gender decision-making groups. For example, it may be the case that the decision-making attributes of women get smothered in mixed gender groups, perhaps because men are more confident and/or vocal in their decision-making assertions. Flynn and Ames (2006) noted that women tend to have less influence over group decisions, compared to men, in part because their behaviour is less assertive.

Summary and Application

These findings should not be interpreted in a binary way as 'females are better decision-makers than men'. Decision-making is a complex, multi-faceted process and different types of decisions require differing approaches. In addition, context, task type and situation matter. These results do suggest the possibility, however, that when information is presented asymmetrically, in such a way as to induce confirmation bias, in the form of the Individual Preference Effect, this manifests differently by gender. The meta-analysis of our studies also implies that the Individual Preference Effect may be even more complicated than previously thought. We believe this finding is an important step in opening up new research avenues that will help us understand decision-making in these scenarios and, furthermore, may also offer an explanation as to why empirical evidence to support the benefits of gender diversity in decision-making groups is so equivocal (e.g. Homberg & Bui, 2013). It is possible that increasing our examination and understanding of this area may open up the opportunity to improve decision outcomes in mixed-gender groups, where previous results have been mixed.

From an applied perspective, a further interesting consideration is whether the *process* of group decision-making should be varied to accommodate the potential gender differences

discussed here. For example, the optimal timing and type of pre-discussion information distribution could differ between male and female group members, given their differing approaches to processing of information and strategies for its usage. These findings also suggest that a 'one-size fits all' intervention to overcome the IPE or improve group decision-making may not be the optimal solution and that something more nuanced is required, recognising the gender differences we have highlighted. Of course, any changes to process, or training or skills interventions, must also take into consideration what is feasible and practical to the well-ordered running of the group, or indeed the larger organisation.

Finally, picking up on the speculations of De Acedo Lizarraga et al. (2007), further research should examine the interaction between decision-making and gendered social roles, for example, by considering the strength of identification with one's gender as a further variable. Would the fact of a male group member, identifying highly as a male, predict greater reliance on heuristic processing? Untangling the answers to these types of questions may open up new thoughts or ideas about ways to overcome these challenges and improve information processing to place less reliance on heuristics. Perhaps it is only once these gender differences in decision-making are further examined and more fully understood that we can advance effective interventions and solutions.

Data Availability Statement

The workbooks that support the meta analytic findings of this study are available in the Kent Data Repository at http://doi.org/10.22024/UniKent/01.01.117 and are currently embargoed. The embargo will be lifted if the paper is selected for publication following peer review.

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Tables

Table 1.
Study Details: Participant Gender, Mean Age/SD and Split by Information Condition.

Study	Total *N* – Hidden Profile (Pre-Exclusion)	Total Hidden Profile Gender Split (Pre-exclusion)	Total *N* – Hidden Profile (Post-Exclusion)	Total Hidden Profile Gender Split (Post-exclusion): M/F	Total *N* - Manifest Profile	Total Manifest Profile Gender Split: M/F
1	42	22 males 19 females (1 gender undisclosed)	33	20 Males (M_{age} = 27.55, *SD* = 6.37), Age Range = 18-40 13 Females (M_{age} = 35.54, *SD* = 12.00), Age Range = 24-64	37	20 males (M_{age} = 30.45, *SD* = 11.02), Age Range = 18-55 17 females (M_{age} = 28.18, *SD* = 5.35), Age Range = 19-38
2	84	42 males 41 females (1 gender undisclosed)	67	33 Males (M_{age} = 34.67, *SD* = 10.25), Age Range = 19-62 34 Females (M_{age} = 35.38, *SD* = 7.99), Age Range = 24-53	76	36 males (M_{age} = 33.08, *SD* = 10.68), Age Range = 19-63 40 females (M_{age} = 32.87, *SD* = 11.05), Age Range = 18-61
3	87	45 males 42 females	56	27 Males (M_{age} = 30.48, *SD* = 9.42), Age Range = 19-58 29 Females (M_{age} = 37.31, *SD* = 11.73), Age Range = 21-61	73	40 males (M_{age} = 30.63, *SD* = 9.74), Age Range = 19-61 33 females (M_{age} = 34.82, *SD* = 10.95), Age Range = 20.57
4	110	53 males 57 females (1 gender undisclosed)	70	35 Males (M_{age} = 32.30, *SD* = 10.23), Age Range = 21-60 35 Females (M_{age} = 35.63, *SD* = 12.54), Age Range – 20-62	126	64 males (M_{age} = 32.73, *SD* = 9.33), Age Range = 18-57 62 females (M_{age} = 36.26, *SD* = 12.35), Age Range = 18-66 (2 gender undisclosed)

5	147	79 males 64 females (4 gender undisclosed)	109	61 Males (M_{age} = 33.28, *SD* = 8.98), Age Range = 21-60 48 Females (M_{age} = 34.44, *SD* = 9.61), Age Range = 21-63	132	62 males (M_{age} = 34.35, *SD* = 8.93), Age Range = 20-62 (1 age undisclosed) 69 female (M_{age} = 34.30, *SD* = 8.68), Age Range = 22-59 (1 gender undisclosed)
6	165	82 males 83 females	137	73 Males (M_{age} = 26.74 *SD* = 9.21), Age Range = 18-61 64 Females (M_{age} = 27.30, *SD* = 8.90), Age Range = 18-57	N/A	
7	174	93 males 81 females	126	65 Males (M_{age} = 31.35 *SD* = 11.81), Age Range = 18-67 61 Females (M_{age} = 32.39, *SD* = 12.04), Age Range = 18-62	N/A	
8	79	38 males 41 females	56	24 Males (M_{age} = 31.75, *SD* = 11.42), Age Range = 19-54 32 Females (M_{age} = 25.84, *SD* = 6.42), Age Range = 18-44	77	49 males (M_{age} = 27.84, *SD* = 10.04), Age Range = 18-67 28 females (M_{age} = 31.64, *SD* = 12.80), Age Range = 19-61
9	78	42 males 36 females	52	27 Males (M_{age} = 32.15, *SD* = 15.80), Age Range = 18-68	76	42 males (M_{age} = 33.05, *SD* = 14.51), Age Range = 18-74

	25 Females (M_{age} = 32.96, *SD* = 12.03), Age Range = 19-64	34 females (M_{age} = 33.03, *SD* = 11.95), Age Range = 18-62

Table 2.
Hidden Profile Results By Hypotheses (excludes participants who did not select the intended initial preference).

H No.	Hypothesis Description	Overall Results				Heterogeneity				
		OR/ Cohen's d	90% CI	Z-Value	*p*-value	Q	P_q	I^2%	T^2	T
1[2]	Female participants will be better able to overcome the IPE and demonstrate more improved decision-making than their male counterparts having viewed full candidate attribute information.	0.56[1]	0.36,0.88	-2.38	.017	13.23	.10	39.54	0.18	0.43
2[3]	Female participants will be more confident in the Optimal Candidate (A) than their male counterparts having viewed full candidate attribute information.	0.14	-0.07,0.34	1.21	.23	14.27	0.08	43.93	0.04	0.20
3[4]	Female participants will be less confident in the Suboptimal Candidate (C) than their male counterparts having viewed full candidate attribute information.	-0.15	-0.36,0.05	-1.39	.16	14.07	0.08	43.13	0.04	0.20
4[3]	Female participants will report lower overall confidence in their candidate selection decision compared to their male counterparts having viewed full candidate attribute information.	0.20	0.07,0.33	2.93	.00	6.49	0.59	0	0	0
5[3]	Female participants will report less difficulty in correcting and amending their candidate selection decision than their male counterparts, having viewed full candidate attribute information.	-0.09	-0.26,0.09	-0.95	.34	10.75	0.22	25.61	0.02	0.14

Note[1]*. Odds Ratio for H1 and Cohen's d for H2-H5.*
Note[2]*. N = 699.*
Note[3]*. N = 704*
Note.[4] *N =702*

Table 2 *(a).*
Hidden Profile Results By Hypotheses (includes all participants irrespective of selection the intended initial preference).

H No.	Hypothesis Description	Overall Results				Heterogeneity				
		OR/ Cohen's d	90% CI	Z-Value	*p*-value	Q	P_q	I^2%	T^2	T
1[2,2a]	Female participants will demonstrate more improved decision-making than their male counterparts having viewed full candidate attribute information.	0.93[1,1a]	0.74,1.18	-0.54	.586	3.07	.93	0	0	0
		0.61[1,1b]	0.43,0.86	-2.65	.008	12.82	.12	37.61	0.11	0.33
2[3]	Female participants will be more confident in the Optimal Candidate (A) than their male counterparts having viewed full candidate attribute information.	0.17	0.05,0.29	2.59	.01	8.09	0.43	1.07	0	0.02
3[4]	Female participants will be less confident in the Suboptimal Candidate (C) than their male counterparts having viewed full candidate attribute information.	-0.06	-0.25,0.12	-0.64	.52	16.50	0.04	51.51	0.04	0.20
4[3]	Female participants will report lower overall confidence in their candidate selection decision compared to their male counterparts having viewed full candidate attribute information.	0.18	0.10,0.25	4.42	.00	3.01	0.93	0	0	0
5[3]	Female participants will report less difficulty in correcting and amending their candidate selection decision than their male counterparts, having viewed full candidate attribute information.	-0.07	-0.21,0.06	-0.98	.33	9.45	0.31	15.36	0.01	0.08

Note[1]*. Odds Ratio for H1 and Cohen's d for H2-H5.*
Note[1a,1b.] Top row = gender differences at Time 1 (partial information); Second Row = gender differences at Time 2 (full information).
Note[2]*. N = 964.*
Note[2a.] *N = 954.*
Note[3.] *N = 962*
Note[4] *N =960*

Table 3.
Manifest Profile - Results compared to Hidden Profile hypotheses (Seven studies only)

H No.	Hypothesis Description	Overall Results				Heterogeneity				
		OR/ Cohen's d	90% CI	Z-Value	*p*-value	Q	P_q	I^2%	T^2	T
1[2,3]	Female participants will demonstrate more improved decision-making than their male counterparts when presented with a one-page structured Manifest Profile (comprising full candidate attribute information).	0.76[1]	0.54,1.06	-1.60	.110	4.44	0.62	0	0	0
2[2]	Female participants will be more confident in the Optimal Candidate (A) than their male counterparts having viewed full candidate attribute information.	0.07	-0.09,0.22	0.83	.41	5.47	0.49	0	0	0
3[2]	Female participants will be less confident in the Suboptimal Candidate (C) than their male counterparts having viewed full candidate attribute information.	-0.12	-0.36,0.12	-1.00	.32	11.60	0.07	48.27	0.05	0.21
4[2]	Female participants will report lower overall confidence in their candidate selection decision compared to their male counterparts having viewed full candidate attribute information.	0.01	-0.17,0.19	0.08	.93	7.52	0.28	20.26	0.01	0.11

Note[1]. Odds Ratio for H1 and Cohen's d for H2-H4.
Note[2]. N = 597.
Note[3]. Since there is only one decision point in the Manifest Profile condition, this decision quality comparison is simply whether male/female participants chose the correct candidate (Candidate A) at the single decision point.

Appendix I - Manifest Profile Stimuli

Candidate Attributes: Please Review Carefully

Candidate A	Candidate B	Candidate C
• Excellent teacher • Faculty research productivity increased • Volunteer • Influential contacts • Thoughtful leader/listener • Secured grant • Collaborative decision maker • Diversity increased	• Nationally recognised researcher • Recognized by business leaders • Emphasized collaboration • Speaking skills	• Pleasant personality • Strategic thinker • Active trustee • Students like as a teacher
• Cold • Out of Higher Education for 4 years • Lacks campus/student life experience • Accused of changing positions	• Seen drinking heavily • Left without raising funds • Discourages innovation • Not responsible for donations obtained	• Had a low success rate in court during legal career • Temper • Tension with Provost • High turnover/abrasive leader
• Is a vegetarian • Plays golf and tennis • Divorced, remarried, 2 children • Apartment in Spain	• Only teaches 1 module • Continues to do some consulting work • Married with 3 children • Likes biking and running • Family lives nearby • Likes to garden • Spouse teaches Spanish • Enjoys sports	• Spouse is a physician • Likes reading mystery novels/biographies • Has a grown-up child • Enjoys cooking • Likes to play bridge (a card game) • Enjoys travelling • Lives in the area • Has 2 dogs and 2 cats

Appendix II – Hidden Profile Stimuli

List W

Candidate Attributes: Please Review Carefully*

Candidate A	**Candidate B**	**Candidate C**
• Influential contacts • Collaborative decision maker	• Nationally recognised researcher • Recognized by business leaders • Emphasized collaboration • Speaking skills	• Pleasant personality • Strategic thinker • Active trustee • Students like as a teacher
• Cold • Out of Higher Education for 4 years • Lacks campus/student life experience • Accused of changing positions	• Seen drinking heavily • Left without raising funds • Discourages innovation • Not responsible for obtaining donations	• High turnover/abrasive leader
• Apartment in Spain	• Spouse teaches Spanish • Enjoys sports	• Lives in the area • Has 2 dogs and 2 cats

List X

Candidate Attributes: Please Review Carefully

Candidate A	**Candidate B**	**Candidate C**
• Thoughtful leader/listener • Diversity increased	• Nationally recognised researcher • Recognized by business leaders • Emphasized collaboration • Speaking skills	• Pleasant personality • Strategic thinker • Active trustee • Students like as a teacher
• Cold • Out of Higher Education for 4 years • Lacks campus/student life experience • Accused of changing positions	• Seen drinking heavily • Left without raising funds • Discourages innovation • Not responsible for obtaining donations	• Had a low success rate in court during legal career
• Divorced, remarried, 2 children	• Family lives nearby • Likes to garden	• Likes to play bridge (a card game) • Enjoys travelling

List Y

Candidate Attributes: Please Review Carefully

Candidate A	Candidate B	Candidate C
• Volunteer • Secured grant	• Nationally recognised researcher • Recognized by business leaders • Emphasized collaboration • Speaking skills	• Pleasant personality • Strategic thinker • Active trustee • Students like as a teacher
• Cold • Out of Higher Education for 4 years • Lacks campus/student life experience • Accused of changing positions	• Seen drinking heavily • Left without raising funds • Discourages innovation • Not responsible for obtaining donations	• Temper
• Plays golf and tennis	• Married with 3 children • Likes biking and running	• Has a grown-up child • Enjoys cooking

List Z

Candidate Attributes: Please Review Carefully*

Candidate A	Candidate B	Candidate C
• Excellent teacher • Faculty research productivity increased	• Nationally recognised researcher • Recognized by business leaders • Emphasized collaboration • Speaking skills	• Pleasant personality • Strategic thinker • Active trustee • Students like as a teacher
• Cold • Out of Higher Education for 4 years • Lacks campus/student life experience • Accused of changing positions	• Seen drinking heavily • Left without raising funds • Discourages innovation • Not responsible for donations obtained	• Tension with Provost (College Head)
• Is a vegetarian	• Only teaches 1 module • Continues to do some consulting work	• Spouse is a physician • Likes reading mystery novels/biographies