Mind the Gap: Addressing Unconscious Bias in Multidisciplinary Team Ideation

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ABSTRACT

While corporate innovation serves as a pivotal competitive advantage for firms, the subtle influence of cognitive biases on the creative process cannot be underestimated. This study aims to explore the extent to which unconscious bias limits ideation within multidisciplinary teams. Ethnographic research and survey findings reveal that unconscious bias does influence ideation by curbing creativity, constraining the exploration of novel concepts, and nurturing criticism of ideas that differ from one's own perspective. Despite the unavoidable presence of unconscious bias, multidisciplinary teams can take proactive measures to recognise, acknowledge, and address it through open communication and managerial coaching.

Key words: Ideation; unconscious bias; multidisciplinary team.

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INTRODUCTION

Team ideation serves as a fundamental pillar in the dynamic landscape of corporate innovation processes. To reach the full potential of the collective mind, however, we need to understand how our knowledge, environment, and past experiences alter the way we make decisions (Biderman et al., 2020). Due to the ample diversity of teams in international settings, the complex interplay of individuals' differences is growing exponentially.

Conflict and disagreement, communication barriers and lack of psychological safety are but a few of the most common and visible innovation process challenges (Nguyen, 2021; Alshwayat et al., 2023; Yong et al., 2014). Nevertheless, there is a more nuanced obstacle. The presence of unconscious bias, a subtle phenomenon that affects a fundamental cognitive process in our brains and adds yet another level of complexity to team ideation, necessitating full awareness and training (Oberai & Anand, 2018). Neither the individual nor the group can reach their full ideation potential if the bias is not addressed.

The idea of thinking without thinking relates to unintentional prejudice which despite its significant implications, remains relatively underexplored in research articles. Most of the current research focuses on the impact of more visible cognitive biases on societal topics such as racism and the identification of unjustified stereotypes (Williams et al., 2020; Heilman, 2012). There is little coverage of research that addresses its effects on the ideation process and how this translates to team development in a professional environment.

Therefore, this paper assesses the following research question: To what extent does unconscious bias limit the ideation process in a multidisciplinary team?

Accordingly, we examined the role of unconscious bias in the ideation phase during the 2022 CERN IdeaSquare Summer School via ethnographic research, combining both qualitative and quantitative approaches. The goal of the Summer School was to identify alternative applications developed at research institutes like CERN (CERN IdeaSquare, 2022). This program provided a unique opportunity to delve into the specific inadvertent innovation challenge due to its interdisciplinary nature. Participants with diverse academic backgrounds formed teams to explore the value of new applications for five ATTRACT program technologies. Examples of such exploration include the development of possible applications of single photon detectors or of 3D visualisation glasses in wider society outside purely research domain (ATTRACT, 2022).

On that account, understanding the role of unconscious bias is pivotal due to three aspects. First, appreciating the role of unconscious bias in the ideation stage can help improve team dynamics by increasing team cohesion and collaboration (Hirica, 2021; Fiarman, 2016). Second, uncovering the influence of such a bias can help enhance innovation and creativity via the interplay of multiple disciplines thus also strengthening organisational performance (Blackwell et al., 2009). Third, discerning the impacts of the subconscious phenomenon helps with the inclusion in addition to promoting fairness and equity (Shenoy & Kumar, 2021). As a result, the findings of this paper can be of powerful guidance in team development for team leaders, human resource professionals or educational institutions.

THEORETICAL BACKGROUND

Building upon the previous discussion, this paper looks specifically on the unconscious biases of status quo, anchoring and functional fixedness. In general, unconscious bias represents an underlying mental process that affects people without their awareness (Suveren, 2022).

To begin with, status quo bias is intimately intertwined with the human tendency of loss-aversion, namely that humans perceive the pain of losses twice as much as compared to the gratification of gains (Eidelman et al., 2012; Yechiam, 2019). This notion can be applied to the preservation of the current state of affairs by specifying that any changes to the status quo are viewed as a loss in terms of time, effort or resources (Geng, 2016). Alternatively, status quo bias, as Samuelson and Zeckhauser (1988) define this phenomenon, is maintaining the current position in spite of change - even if this change offers an objectively better solution.

One can straightforwardly apply and evaluate the potential impacts of such unconscious bias in the ideation process. For instance, individuals might be less likely to explore new applications of technologies or demonstrate lesser effort during the course of ideation. The aforementioned can have substantial detrimental consequences for the ideating team as well as for the larger organisation due to suboptimal innovation proposals. In line with the presented negative organisational impacts of status quo bias, a Harvard Business Review article delineates that past strategic frames that have once ensured one's company's success can become its own shackles (Sull, 1999).

The next investigated bias, anchoring, is a phenomenon that occurs when individuals rely heavily on a specific piece of information and have difficulty deviating from it (Lieder et al., 2018). The initial anchor value which is used as a mental shortcut is rarely a suitable reference estimate leading to suboptimal decisions about the potential of a future product (Kahneman & Tversky, 1979). According to Lieder et al., (2018), the given anchoring information can even often be considered immaterial in the specific decision-making process. Still, however, individuals take it unconsciously into account when reaching a conclusion.

Similar to status quo bias, anchoring can also stifle the innovation process and is commonly exacerbated in instances of uncertainty. To give an example, the initial information about the technology's application could have been used as an anchor even though the purpose of the assignment was to explore new applications. Furthermore, anchoring can also negatively impact the ideation process by underestimating the possibility of failure, overestimating the relevance of historic results as well as limiting creativity (Smith et al., 2010; Edwards & Rodriguez, 2019; Mumford et al., 2006).

The final unconscious bias, but perhaps the most impactful one in the CERN Summer School context, is functional fixedness. The specified unconscious bias discusses the instance where individuals tend to dismiss alternative applications of a given tool and stick to the traditional utilisation of the instrument (Munoz-Rubke et al., 2018). Johnson et al. (2021) give the example of only seeing a hammer as a tool for driving in nails, even though it can be used for alternative purposes, such as to raise weighty objects or wire cutting. As a consequence of the solely traditional view of the usage of tools, novel applications with wider societal applicability are missed (Caprioli et al., 2023).

There are multiple aspects of how the aforementioned cognitive bias can impact the ideation phase. Team members might be again reluctant to go beyond the original usage of the technology or underestimate alternative potential applications (Orstad, 2018). Even if such new applications are identified, individuals might underperform in thinking of fresh and creative use cases for the technology (Mehta & Zhu, 2016; Hallihan & Shu, 2011). Consequently, the most brainstorming heavy phase of the innovation process can be detrimentally impacted with suboptimal ideas.

It is essential to mention that there can be instances where multiple biases are present in a team at the same time. For this purpose, the direct observation section first takes a more open approach and focuses on the presence of unintentional behaviours during agreements, arguments, and creative collaboration. This method allows for the documentation of all actions, and then a thorough assessment of the presence of bias. Following the direct examination, each of the survey questions inquires about a specific bias.

To conclude, all three of the investigated unconscious biases have the potential to stifle the ideation process and endorse suboptimal creative thinking. Hence, the investigation of the extent of the negative impact provides for a relevant academic inquiry given the present research gap.

METHOD AND DATA

The study is situated within the CERN HPD Summer School in Geneva, Switzerland (CERN IdeaSquare, 2022). There are five teams, each group consists of two members with an engineering background from TU Delft, one member specialising in natural sciences from the University of Amsterdam, and one with a business background from the Rotterdam School of Management.

The purpose of diverse teams - that comprises individuals of different ages, genders, ethnicities, academic backgrounds, and personalities - is to foster a range of perspectives and thinking approaches. To uncover unconscious bias, we employ ethnographic research to explore whether multidisciplinary teams can improve idea generation. Ethnographic research is a process that documents, observes and converses with the participants to uncover how they behave in their natural

environment (FitzGerald and Mills, 2022). The direct observations of team dynamics are supported by conversations with external individuals. The aim is to discern the potential extrapolation of these behaviours beyond the confines of the Summer School environment.

To complement the qualitative approach, a survey is shared with the participants. This mixed-method approach enables an exploration of the teams' thoughts and behaviours during and after the ideation. The survey encompasses three questions designed to reflect on the ideation process.

The score of each question utilises a Likert scale (Mcleod, 2023) ranging from 1 (strongly agree with the bias) to 5 (strongly disagree with the bias). The following are the questions:

- To address the status quo bias: Did you find yourself inclined to stick to familiar ways of thinking, rather than easily move beyond your existing knowledge and explore new perspectives?
- To assess anchoring bias: Did you feel influenced by the information you read, particularly the application provided on the technology card, and did it constantly shape your thinking throughout the process?
- To explore the bias of functional fixedness: Were you more inclined to instinctively reject new ideas, and did you not naturally consider how to make them work and explore their potential?

RESULTS

4.1 Direct Observation

This section of the results highlights observations made during ideation sessions, focusing on team dynamics to detect any signs of bias. To ensure the credibility of these observations, we engaged in discussions with external individuals to evaluate potential behavioural patterns extending beyond the Summer School setting.

The first observation reveals distinct thinking patterns within each individual. Notably, team members with technical or scientific backgrounds tend to emphasise idea feasibility, while those from business backgrounds prioritise ideas' profitability and market acceptance. Despite their eagerness for creativity, we observed scepticism towards ideas that did not align with their inherent tendency. This behaviour, akin to status quo bias, manifests as a reluctance to depart from established thoughts that come naturally to the person. The criticism of each other's ideas resulted in feelings of exclusion and a lack of receptiveness in the team. Recognising the negative impact, two out of the five teams regrouped and engaged in an open conversation to understand their differences and collaboration

challenges. This process enabled them to uncover why they tend to reject ideas that do not align with their individual thinking styles. This demonstrates the potential of multidisciplinary teams to collectively recognise and mitigate unconscious bias in ideation.

We also observed how the environment affects the ideation process. Presentations, technology info cards, and expert discussions influenced participants' expectations regarding the technology's application. Many team members unconsciously tailored their thinking to the information presented, which restricted their exploration and creativity in generating new ideas. This phenomenon, known as anchoring bias, was more pronounced due to the inherent uncertainty of the project and differing levels of understanding of the technology's application within teams. Throughout the ideation process, we noted a tendency to reference earlier information, which ultimately hindered innovation, stifled creativity, and placed excessive emphasis on past results rather than future potential applications.

Finally, the presence of functional fixedness was also noted. The teams deliberated about the potential uses of the technologies straightaway; however, they stayed within industries which are identical or closely related to the original industry. For instance, the 3D head-wear visualisation was meant to be primarily used in healthcare, and despite numerous non-related potential applications, the team has come up with homogenous utilisation of the technology, specifically for skin detection. Similarly, the team has focused on alternative scanning uses in dentistry, which is again interconnected with healthcare as a whole. Only after an external mentor pointed out the similarity between the original and proposed application has the team shifted words to a broader industry mindset.

4.2 Conversations

In addition to our observation of the team dynamics, we conversed with three managers from distinct environments, namely corporate, start-up, and scientific settings. We deliberately selected these individuals for their pivotal roles at the intersection of innovation and business. The objectives of these dialogues are twofold: firstly, to uncover and scrutinise any instances of bias that might have not been detected in the direct observations, and secondly, to evaluate whether the team behaviours observed are replicable and visible in other environments. This approach allows us to gain an understanding of bias dynamics and their potential universality across different work settings.

During the corporate talk, a manager at an automotive paint company introduced a scenario centred around transitioning from conventional solvent-based coatings to innovative water-based alternatives. While the water-based coatings exhibited superior performance, the team exhibited a distinct inclination towards the tried-and-true solvent-based option. This preference stemmed from a natural affinity for the familiar, as well as a reluctance to

venture into uncharted territory. Essentially, the team's apprehension toward embracing something new underscored a case of status quo bias. This bias reflects the propensity to uphold the comfort of the known, even when presented with potentially superior alternatives.

In the start-up conversation, a product owner talked about the use of "cryogenic" and selling the product to another target audience. It was noted that alternative industries for application and sale were difficult to envision due to the prevalence of the associations with the word cryogenic. The aforementioned, can be ascribed to functional fixedness bias, as there were limited ideas for other industry applications. The product owner went as far as to mention that the company is trying to tackle this problem by removing the cryogenic component that will decrease the accuracy of the machine.

In the final conversation, a leader from CERN's antimatter factory discussed the challenges scientists face when presenting new project ideas. This difficulty stems from the common practice of using introductory presentations prior to the business meetings. Unfortunately, the leader explains how the initial notes often shape the opinions of the audience before they fully engage with the content. This presents anchoring bias and illustrates how people tend to stick to their initial impressions. As a result, it becomes tough for the non-scientists to change their minds, even when presented with compelling new insights later on.

4.3 Survey

Table 1. Participants' results of the survey

	Responses on Scale Range per Question				
	1	2	3	4	5
Q1. Did you find yourself inclined to stick to familiar ways of thinking rather than easily move beyond your existing knowledge and explore new perspectives?	2	3	1	2	2
Q2 Did you feel influenced by the information you read, particularly the application provided on the technology card, and did it constantly shape your thinking throughout the process?	4	1	2	3	0
Q3 Were you more inclined to instinctively reject new ideas, and did you not naturally consider how to make them work and explore their potential?	1	4	2	2	1

Table 1 summarises the survey results of 10 team members. The three questions aim to uncover potential biases in the ideation process by exploring the inclinations and thought patterns of the participants.

Analysing the average scores for each question - 2.7 for the status quo in Q1, 2.4 for anchoring bias in Q2, and 2.8 for functional fixedness in Q3 - gives us insight into how the average respondent reflects on the presence of unconscious bias. As there is a limited number of respondents, we cannot draw strong conclusions. Instead, the average scores support the initial trends present in the direct observation section and pave a path for future research.

The average scores from all three questions collectively suggest the presence of unconscious bias during the ideation process, with lower scores implying a higher degree of bias. When participants were asked to reflect on their actions and decisions, they showed the ability to reflect on their behaviour, the effect of information presented on, or their existing knowledge influenced the brainstorming sessions.

Prominently, among the three questions, the second one, which addresses anchoring bias, stood out with the lowest average score, although only marginally different from the others. This finding aligns with the ethnographic research outlined in the first results section, where individuals repeatedly referenced the informational cards, displaying the pivotal role of the environment in shaping their ideation process.

DISCUSSION AND CONCLUSIONS

Corporate innovation increasingly proves to be the main competitive advantage of firms across a multitude of fields. Nevertheless, the creative processes can be disrupted by cognitive biases that subconsciously influence team dynamics. This research paper investigates *"To what extent does unconscious bias limit the ideation process in a multidisciplinary team?"*

Our results from the ethnographic research and survey show that unconscious bias, to a certain extent, has a role in the ideation process. People are influenced by the information they encounter and their inherent thought patterns. This leads to reduced creativity, a reluctance to explore new directions, and criticism of ideas that differ from their own. Nonetheless, we find that multidisciplinary teams have the potential to reduce this bias through open communication and active listening. Unconscious bias is inevitably going to be present, but it is within the team's control to recognise, acknowledge, and address this resistance.

The limitations of this research can be categorised as twofold. Firstly, our ability to directly observe the team dynamics at all times during the ideation process was limited, and our insights into these interactions remain partial. Secondly, our survey was limited to a sample of only 10 participants, offering a perspective on only half of the summer school attendees.

For future research, we propose two extensions. Firstly, we recommend the incorporation of control groups. One group will receive the supplementary

information after an ideation round, while the other group will receive the information prior and during the brainstorming sessions. Secondly, we advise conducting post-ideation interviews with team members. These conversations can provide valuable insights, on top of the observations, into their experiences, shedding light on whether they felt interrupted, challenged, or had already committed to specific ideas.

IMPLICATIONS FOR INNOVATION MANAGEMENT

Given the potential for unconscious bias in ideation, managers must proactively identify and reduce its effect on decision-making. One effective strategy is to challenge team ideas systematically, ensuring a thorough exploration of options. Managers should, similar to the Socratic management style (Akin, 2022), pose probing questions about the genesis of ideas, scrutinise the factors considered, and be critical of the team members' backgrounds in connection to the explored topic. Recognising the inherent nature of bias, managers ought to cultivate a culture of continual questioning, practice, and heightened awareness to foster an environment that is open to new and potentially uncomfortable ideas.

To further mitigate bias and enhance innovation, managers can establish multi-disciplinary teams, incorporating diverse thinking styles, skills, and problem-solving approaches. This not only encourages a broader range of perspectives but potentially also contributes to more creative solutions. It is imperative, however, to prevent any single individual from dominating discussions with their particular viewpoint. Encouraging teams to brainstorm ideas without any internal or external risks can allow more expansive and user-focused thinking. This approach promotes a culture of inclusivity, allowing for the exploration of innovative solutions unencumbered by preconceived notions and biases.

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