Level of Anonymity in Creative Brainstorming for People with Varying Creative Self-Efficacy

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ABSTRACT,

In increasingly competitive and global markets, companies are continuously looking for ways to improve their product offerings, services, and internal processes. Innovation is required for improvement across these aspects. In order for innovation to happen, idea generation is required. This is where brainstorming becomes a useful tool for these innovative companies. Typically, traditional brainstorming provides no form of anonymity to its participants, but over time anonymous brainstorming has proven to have its advantages. This paper goes a step further to discuss a technique called selective-anonymous brainstorming. The study described in this paper was designed to test if and when selective anonymity brainstorming would be superior to anonymous and / or non-anonymous brainstorming. While the research described in this paper was unable to find a significant difference between the quality of best ideas produced by either of the three conditions, some interesting findings were discovered on how creative self-efficacy moderates the relationship between selective anonymous brainstorming and quality of best ideas, and the relationship between non-anonymous brainstorming and quality of best ideas.

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Keywords

Brainstorming, Brainwriting, Idea Generation, Creativity, Anonymity, Selective Anonymity, Self-Efficacy, Creative Self-Efficacy

1. INTRODUCTION

1.1 Introduction to Brainstorming and Anonymity

Within the field of Entrepreneurship, Innovation & Strategy, idea generation is a key task. In the face of increasing competition, the methods in which companies conduct creative idea generation are changing, it is no longer solely a board room meeting where the companies' creative team meets to brainstorm. Companies are using creative methods to get creative results. Furthermore, companies are becoming aware of the need to acquire knowledge and ideas from outside of the organisation, by utilising all kinds of stakeholders in the idea generation process (Annosi et al., 2022).

Brainstorming is a tool which can be utilised to help accomplish the task of idea generation. Brainstorming is a creative idea generation technique for a group setting expressed through verbal communication. Whereas brainwriting, which is a method within brainstorming, is a technique characterised by where the individuals silently write or type their creative ideas without verbal communication with other participants (Michinov, 2012). There are different ways in which brainstorming / brainwriting can be conducted. Relevant to this research are: non anonymous / identifiable brainstorming, anonymous brainstorming, and selectively anonymous brainstorming.

The setting of brainstorming and brainwriting tasks can vary. They can take place in the traditional setting of a face-to-face group or electronically using a computer and the internet. Regardless of the in-person or electronic setting, there is also a hybrid method of brainstorming which involves the individual participants starting with brainwriting and then coming together in a group with their initial ideas to then brainstorm as a group, building on the ideas brought forward by the individuals (Girotra et al., 2010). This type of interaction can also be called a nominal group (Paulus et al., 2005). Nominal group brainstorming is a good example of how the electronic and face-to-face settings can be utilised together. Efficiency and effectiveness may be increased when people start by electronically brainwriting and conclude by building on the individuals' ideas in a face-to-face brainstorming session.

Aside from the physical setting of brainstorming tasks, the conditions of the brainstorming task can be manipulated by increasing or decreasing the level of anonymity provided to participants. The literature on anonymous and non-anonymous brainstorming explains multiple ways to conduct the task. A typical non-anonymous method is where a number of individuals are placed into a group to form and develop ideas. The participants can verbalise their original ideas and build further on each other's ideas. The standard brainstorming rules include quantity over quality, all ideas are accepted, take inspiration from each other's ideas, and judgement is withheld. However, normal factors that can inhibit the effectiveness of a brainstorming session are evaluation apprehension, motivation losses, and production blocking (Le Hénaff et al., 2018). Evaluation apprehension is the individuals' apprehension of being judged by the other participants, even though a typical rule of brainstorming is to withhold judgement. The term motivation loss is a self-explanatory one, individuals may experience motivation losses due to social loafing or free riding within the brainstorming group. Finally, individuals have to take turns in presenting their ideas, production blocking can occur when dominant members block the opportunity for passive members to communicate their ideas (Paulus et al., 2005).

Anonymous brainstorming is where the individual participants silently write down their own ideas, with the knowledge that their identity will not be revealed as the idea creator. This can be facilitated through electronic brainwriting, which is where the participants type their ideas up using a computer. The ideas can be displayed in an online environment and identities can be kept hidden. In-person brainwriting is often facilitated through the use of Post-it notes. Participants can silently write down their ideas onto Post-it notes which are then pooled together at the end of the session for comparison, the key point is that all Post-it notes are the same colour, in order to provide anonymity (Michinov, 2012). Of course, normal paper can be used in this scenario, the key to providing anonymity is that all paper, in which the ideas are written onto, is identical. Furthermore, brainwriting can be done non-anonymously if the idea creator's identity is revealed after submission of the ideas.

This paper builds on this to utilise these different methods as a way to conduct and define selectively anonymous brainstorming, through utilising electronic brainwriting, as it can easily allow for identities to be shown, when required.

Within the context of this research, selectively anonymous brainstorming means that only the ideas ranked within the top 10% of total ideas will be revealed at the end of a brainstorming round. The information that is revealed in this scenario includes the description of the idea, the name of the idea's creator, and the overall rank and evaluation score of the idea. For clarification, after a non-anonymous brainstorming round the description of each idea will be revealed along with the idea's creator and overall rank and evaluation score. Finally, after an anonymous brainstorming round absolutely no information will be revealed. This is made possible through participants accessing the task by remotely joining an online environment. In other words, the task setting is that of electronic brainwriting.

These different methods of brainstorming can influence the number of ideas produced and the quality of the ideas produced, i.e., the idea quantity and quality. Furthermore, other factors can mediate and moderate the relationship between the brainstorming conditions and the quantity or quality of the ideas generated. For example, the previously mentioned factors of evaluation apprehension, free riding, and production blocking may be mediating factors of the brainstorming to outcome relationship. An example of a moderating factor of the relationship could be the participants creative self-efficacy, because a person's belief in their creative ability will influence their effort expended in a creative task (Beghetto, 2006), and greater effort will likely produce greater results. Self-efficacy is a person's belief of their own level of capability. Therefore, creative self-efficacy is a person's belief of their capacity to be creative. If someone is said to have a low creative self-efficacy this means they believe that they are not a very creative person. If someone is said to have a high creative self-efficacy this means the person has confidence in their creative abilities.

1.2 Research Question

Due to companies beginning to utilise various types of stakeholders in their idea generation processes (Annosi et al., 2022), it is important to be aware of how to get the best efforts out of these stakeholders, regardless of their creative backgrounds and abilities. Therefore, this paper is going to investigate the relationship between the level of anonymity (meaning fully anonymous, not anonymous, or selectively anonymous) and the quality of the best ideas, with creative self-efficacy as a moderating variable. This paper also introduces selective anonymity, a technique developed by Dr. Tim Schweisfurth, as a new option for a brainstorming method which can combine the advantages of full anonymity and identifiability.

Therefore, the research question of this thesis paper is:

What impact does creative self-efficacy, as a moderating variable, have on the relationship between the level of anonymity and the quality of best ideas?

2. LITERATURE REVIEW

2.1 Brainstorming and Anonymity

There is a large amount of literature on brainstorming available, often researching into how to best maximise effectiveness of brainstorming sessions. It is important to understand why brainstorming is important and relevant. In almost any type of innovation process, generating and selecting ideas will be required. This can be seen in many types of businesses across many industries. For example, a company producing any type of consumer good will start by generating a vast number of varying ideas, they will eventually cut the ideas down to the best ones and finally pick the top few ideas to research further or create prototypes (Girotra et al., 2010).

Many researchers have attempted to distinguish how to best utilise brainstorming. The original standard practice of group brainstorming, introduced by Osborn, has in many cases been found to be the least productive of the methods (Holt, 1996). The build-up of ideas, previously thought to be a benefit of group brainstorming, has been found to be a limitation on the idea generation process (Girotra et al., 2010). On the one hand, aspects of group brainstorming, such as laughter between members, is thought to reduce self-censorship which then improves performance (Schmitt et al., 2012). Paulus and Dzindolet (1993) found that individuals partaking in interactive group brainstorming are influenced by the performance of the other group members, meaning that individuals may be motivated to improve their performance when in the presence of high performers. However, the cons appear to out-way the pros in that the problems such as production blocking, social loafing, and evaluation apprehension actually hold group brainstorming back from being as effective, in the performance of creative idea generation, as first thought to be (Furnham, 2000); (Le Hénaff et al., 2018).

Due to the downfalls which are present within verbal brainstorming, more effective methods are investigated. Electronic brainstorming and (non-anonymous) brainwriting appear to be superior in effectiveness over traditional brainstorming (Michinov, 2012). Brainwriting and brainstorming are not mutually exclusive, brainwriting has been used as a step within the group brainstorming process. In that, there are benefits to utilising individual brainwriting and then bringing those ideas forward into the group brainstorming process, or vice versa, to achieve results (Paulus et al., 2015). Brainwriting has the potential to avoid or minimise some of the downfalls of brainstorming, such as production blocking and dysfunctional interpersonal conflicts (Heslin, 2009). Nominal groups, which involve individuals working alone and then coming together to work as a group, have also been found to produce more ideas than traditional brainstorming (Mullen et al., 1991). However, fear of judgement is still an issue which plagues traditional brainstorming. This is where anonymity proves to be useful.

Fear of criticism, or in other words evaluation apprehension, has long been understood to be a major limitation of group brainstorming (Harari & Graham, 1975). This is where anonymity can help. There are already many real-world examples of where anonymity has positive effects, such as, formal religious confessions and crime reporting (Valacich et al., 1992). Anonymity provides positives for brainstorming group members in that they can offer their contributions without fear of judgement or repercussions, and furthermore, anonymity in the evaluation process can promote objectivity, because evaluators can cognitively separate contributions from their contributors (Valacich et al., 1992). Meaning that an evaluator cannot be tempted to bring bias into the evaluating process. Pissarra and Jesuino (2005) demonstrate that anonymity has great positives in the creative process. Anonymity allows for the reduction of inhibitions within an individual, which can encourage people to express unconventional ideas. This is beneficial in the creative process as originality is typically a performance measure. Furthermore, in the world of innovation and entrepreneurship, the generation of original ideas is a key step towards innovation, which encompasses commercialisation as well as idea generation in order to add value to enterprises (Chang, 2011). Le Hénaff et al. (2018) conducted an experiment where participants were randomly divided into groups of four, the groups were then placed into two rooms, with four groups per room. The participants were given a 20-minute brainwriting task and they were randomly allocated to different experimental conditions. These conditions were anonymity vs. individuation (i.e., non-anonymity) and low salience of intergroup comparison vs. high salience of intergroup comparison. They discovered that when intergroup comparison was not salient, more original ideas were produced under the anonymity condition than under the individuation condition.

However, there are of course negatives, a lack of identifiability, in other words full anonymity, can increase free riding within a group brainwriting task (Diehl & Stroebe, 1987). A method which may be used to combat social loafing / free riding is rewards and recognition. Anonymity may actually have a negative impact on the motivational powers of rewards, if recognition is not present (McLeod, 2011). Furthermore, identifiability may encourage people to not want to perform badly (McLeod, 2011). Therefore, it would be beneficial, to companies who rely on innovation, to find a method which takes the advantages of anonymity and the advantages of identifiability, to create a more efficient and effective brainstorming process.

As can be seen from the literature, there are many cases where anonymity is utilised, identifiability is utilised, and a combination of the two in the form of nominal groups is utilised. However, there does not appear to be instances where selective anonymity has been utilised. Therefore, this paper will give a definition for selectively anonymous brainstorming and highlight how it can be utilised.

2.2 Creative Self-Efficacy

Literature exists which looks at the effects of personality traits on the brainstorming process (Furnham & Yazdanpanahi, 1995). Self-efficacy is the belief a person has that they can successfully execute the behavior needed to produce the required outcome (Bandura et al., 1977). A person's perceived self-efficacy can influence the activities they chose to partake in, their coping efforts during an activity, the effort they will put into the activity, and how long they will persist in an activity in the face of adversity (Bandura et al., 1977).

Creative ability is of course a necessary requirement of creative expression. However, ability itself is not enough. As with other behaviors, a person's creative expression appears to be influenced by the individual's self-belief in their ability to produce a successful creative outcome (Beghetto, 2006). Creative self-efficacy is a person's belief in their capabilities to produce creative outcomes (Tierney & Farmer, 2002). Therefore, a person's belief in their creative abilities will influence their persistence and effort in a creative task (Beghetto, 2006), as well as their ability to cope during the task and their

persistence when the task is unpleasant or difficult (Bandura et al., 1977).

A study conducted by Tierney and Farmer (2002) found creative self-efficacy to be significantly, and positively, related to creative performance. Furthermore, a study conducted by Gong et al. (2009) also found creative self-efficacy to be positively related creativity. However, literature is scarce on the discussion of creative self-efficacy in the idea generating brainstorming process. In turn, there appears to be a lack of literature on the relationship between anonymity, creative self-efficacy, and brainstorming outcomes. This may be because companies will typically have highly creative people on their idea development teams. However, when a company decides to utilise other stakeholders for a brainstorming session, a person's creative self-efficacy and how to best utilise them will then become relevant. This is where the present paper hopes to shed light.

3. THEORETICAL BACKGROUND

There are aspects of traditional group brainstorming which can allow for improved performance of creative brainstorming (Schmitt et al., 2012). However, ultimately production blocking, free riding and evaluation apprehension all put limitations on the effectiveness of group brainstorming. One of the key standard brainstorming rules is 'to withhold judgement'. Despite this, fear of judgement leads to inhibitions placed on individuals which can then stop them from expressing the more unconventional, in other words original, ideas that they may have. This is further emphasised in people with low creative self-efficacy, as the adverse conditions of judgement may negatively influence their effort and willingness to persist in the creative task (Bandura et al., 1977). Originality adds to the quality of the idea, along with other factors such as feasibility, which is why it is so important for individuals to feel that they can freely express their most original and unconventional ideas with truly no fear of judgement. By brainstorming / brainwriting alone, or in a nominal group setting, production blocking and free riding should in theory be removed. Individual and nominal group brainstorming has been found to be superior to traditional face-to-face brainstorming (Furnham & Yazdanpanahi, 1995). However, evaluation apprehension can still stand because although the group members may be removed, there is still judgement from those who will assess the ideas produced. This is where anonymity can come in to reduce the inhibitions felt by individuals (Pissarra & Jesuino, 2005).

Unfortunately, anonymity, or lack of identifiability, can in reality bring back one of the problems seen in traditional group brainstorming. This problem is free riding. In a group brainstorming setting people can feel demotivated due to the unidentifiability of their contributions (Diehl & Stroebe, 1987). Furthermore, while rewards can be used as a motivational tool to encourage participation, lack of public acknowledgement / identifiability can inhibit the motivational effect of rewards (McLeod, 2011). This problem may also carry through to a setting of individual brainstorming with full anonymity, because although evaluation apprehension may now be removed, the lack of identifiability of their contribution to the company / task may be demotivating. This may be because they feel the task a waste of time when there is not a publicly acknowledged 'reward' for their efforts. Therefore, an individual type of freeriding, or doing the bare minimum, may occur.

Theoretically, anonymity should prevent evaluation apprehension and production blocking. Whereas identifiability, in combination with reward / acknowledgment for effort, should prevent free riding. Therefore, an 'in between' level of anonymity, known in this paper as selective anonymity, should be able to prevent production blocking, evaluation apprehension and free riding. Hence, the theoretical model is created, and can be seen in Figure 1., which expects creative self-efficacy to moderate the relationship between the level of anonymity and the quality of best idea, because of the increased level of effort and perseverance which comes with increasing self-efficacy.

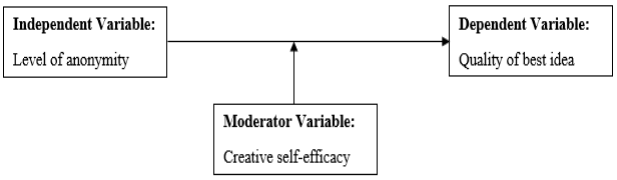

Figure 1. Theoretical Model

As previously stated, anonymity can provide positives into the creative process, such as the lowering of evaluation apprehension (Pissarra & Jesuino, 2005). Brainwriting alone as opposed to group brainstorming removes the issue of production blocking (Heslin, 2009). Therefore, it could be expected that anonymous brainwriting would produce a higher quality of best ideas than would non-anonymous brainwriting. However, lack of identifiability and acknowledgement may reduce individual's motivation and in turn the quality of best ideas produced (Diehl & Stroebe, 1987);(McLeod, 2011). With literature contradicting on whether anonymous or non-anonymous brainstorming produces better quality ideas, and selectively anonymous brainstorming not yet being a part of the literature, the first two hypothesis have been developed as follows:

H1a: The quality of best ideas produced differ between the three groups of the independent variable.

H1b: Selectively anonymous brainstorming produces a higher quality of best ideas than does anonymous and non-anonymous brainstorming.

A person's belief in their creative ability has been shown to effect the creative output they produce (Tierney & Farmer, 2002);(Gong et al., 2009). Building on this, a person's belief in their ability to execute a behavior or task will influence the effort and perseverance put into that behavior or task (Bandura et al., 1977); (Beghetto, 2006). From this we can infer that a person with a higher level of creative self-efficacy is able produce a higher quality of creative output and will be more willing to persevere with effort in the face of adversity, such as judgement from others. It is therefore possible that a person with a lower level of creative self-efficacy might be capable of producing an improved creative outcome when adversities such as judgement and production blocking are removed. Therefore, the following hypothesis is developed:

H2: As creative self-efficacy increases, the impact of anonymous brainstorming on quality of best ideas will not change significantly.

Furthermore, public acknowledgement or reward for a job well done should also provide a motivational factor to people to put in effort and perseverance. The identifiability required for public acknowledgment could lead to evaluation apprehension within people with lower creative self-efficacy. Meaning that this supposed motivational factor will likely be less effective in an individual who believes their creative outcomes to be of poor quality. Based on this, it is possible that selective anonymity will allow individuals with low creative self-efficacy to feel the motivation of potential acknowledgment while still being sheltered from evaluation apprehension, by the knowledge they will only be acknowledged if their idea is in the top 10%. In turn, these individuals may be able to create better quality ideas. Furthermore, the combination of opportunity for acknowledgment / reward and high creative self-efficacy has the

potential to exponentially positively effect task motivation and, in turn, outcome. Therefore, the following hypothesis is developed:

H3: As creative self-efficacy increases, so will the impact of selective anonymity on quality of best ideas.

Finally, the identifiability of non-anonymous brainstorming will likely hinder the efforts and, in turn, outcomes of the individuals with lower creative self-efficacy and increase the efforts and outcomes of those with higher creative self-efficacy. Therefore, the following hypothesis is developed:

H4: As creative self-efficacy increases, so will the impact of non-anonymous brainstorming on quality of best ideas.

4. METHODOLOGY

4.1 Experimental Design

To compare the outcome of idea quantity and quality under different types of anonymity conditions, a study was created which allowed for manipulation of the level of anonymity provided to the subject. The study was a joint research project conducted by the University of Twente, the University of Stuttgart, and the University Erlangen-Nurnberg. The experiment provided either full anonymity, selective anonymity, or no anonymity, and allowed for the measurement of idea quantity, quality, and other individual traits of the participant. For this study, a between-subjects design was employed. In such a design, the subjects generate ideas under only one of the three treatments. This allowed for measurement and comparison of things such as the average level of evaluation apprehension felt among participants over the three treatments. Furthermore, we can compare the outcomes from people with certain traits, such as creative self-efficacy, to see how the outcomes differ between the three treatments. This type of experimental design, in comparison to a within-subjects design, has fewer threats to internal validity, meaning the confidence you can have that a cause-and-effect relationship in the study cannot be explained by other factors (Bhandari, 2022). However, this type of design does require more participants for high statistical power, meaning that the test results are likely valid (Scribbr, N.D.).

4.1.1 Subjects

The subjects for the experiment were students recruited from the University of Twente. A randomised control trail with 225 participants was used. At the time of data analysis, 47% of participants had responded. Therefore, 106 is the number of participants relevant to the experiment discussed in this paper.

4.1.2 Treatments

There were three different treatments used, each participant experienced only one treatment. These were, full anonymity, selective-anonymity, or no anonymity. The idea generation process was identical for all subjects. Participants individually filled in an idea generation survey, remotely using their computer or laptop. Under all three treatments the ideas were evaluated and ranked anonymously. Under the condition of full anonymity, subjects were informed before the task that after the evaluation NO information from the brainstorming challenge would be revealed to other participants. This included, the description of the idea, the overall rank and evaluation score of the idea, and the name of each idea's creator. Under the condition of no anonymity, subjects were informed before the task that after evaluation ALL information from the challenge would be revealed to the other participants, via the online university environment. This included, the description of the idea, the overall rank and evaluation score of the idea, and the name of each idea's creator. Within the selective anonymity condition, subjects were informed before the task that after evaluation, information from the brainstorming challenge will be revealed to other participants only if the idea ranks among the top 10% of all ideas. This included, the idea's description, its rank and score, and the name of the idea creator. Therefore, if a participant's idea ranked among the bottom 90% of ideas, then description, rank / score, and the creator's name would remain anonymous.

4.1.3 Experiment

The survey opened by informing the subjects of the purpose and background of the study, as well as asking the participant to consent to five terms and conditions. Participants were then informed of their challenge. The challenge description was as follows: *You have been retained by a manufacturer of sports and fitness products to identify new product concepts for the student market. The manufacturer is interested in any product that might be sold to students in a sporting goods retailer. The manufacturer is particularly interested in products likely to be appealing to students. These products might be solutions to unmet needs or improved solutions to existing needs. Please come up with ideas for new product concepts in the field of sports and fitness products for the student market*.

Subjects were then informed of the rules for the brainstorming task, which was the treatment of either full anonymity, selective anonymity, or no anonymity. Subjects then partook in the actual brainwriting task, where they were asked to come up with and type up between one and ten ideas. Subjects were advised to take five to ten minutes for the task, but this was not enforced due to the remote nature of the task. Finally, the survey was closed off by participants answering several questions on their creative self-efficacy, gender, evaluation apprehension, and more. From the 106 participants, 457 ideas were generated in total. Of the 457 ideas, 449 ideas were deemed relevant by the majority of the raters. Meaning, that 8 of the ideas provided were deemed to not be suitable responses to the task.

4.2 Measurement of Quality

The experiment allows for measurement of idea quantity and quality, but for this research paper only the accurate measurement of idea quality was required. More specifically, this paper compares the quality of the best idea produced per person, as opposed to the average quality of all ideas produced per person. This is because within innovation and entrepreneurship, companies typically prefer to have one outstanding idea over many mediocre ideas (Girotra et al., 2010). The measurement of quality of ideas was based on three relevant dimensions, idea novelty / originality, user value / usefulness, and purchase intent. These dimensions are relevant to idea quality, within the field of business innovation, because for a new product to be successful it will need to be original, provide value to the user, and have a customer market which desires to purchase the product. While it is desirable to have a novel product, novelty alone is not enough to make a viable product (Kudrowitz & Wallace, 2013), hence why more than one dimension was required to accurately measure overall idea quality. These measurements were done based on the technique introduced by Amabile (1982), known as the consensual assessment technique, which is a way of a creative matter being subjectively judged by an assortment of experts from the relevant field.

4.2.1 Purchase Intent

The ideas generated by the subjects were evaluated for purchase intent, meaning the likelihood the rater would personally purchase the product. The rating was done by 7 bachelor thesis students, who were all completely distinct from the test subjects, and can provide a perspective of potential customers as we are

potential customers, due to our student status. Purchase intent, along with the other two dimensions, were assessed across a 7-point Likert scale, with 1 being very unlikely to purchase, 4 being neutral, and 7 being very likely to purchase. This method is similar to how Girotra et al. (2010) measured purchase intent in their study, the main difference being that they used a 10-point scale as opposed to a 7-point scale.

It can be considered that novelty, user value, and purchase intent all carry equal weight within the overall dimension of idea quality. Therefore, the overall score of quality was between 3-21, which was then divided by 3 to allow the overall quality to be scored from 1-7. The idea descriptions were provided anonymously, and each idea was assessed by all 7 raters.

Finally, it was decided that inter-rater reliability was not a necessary measure for purchase intent. Due to the wide range of ideas provided, and the rater's individual needs and likes, a product idea which is highly desired by one rater may be highly undesirable to another rater. For example, special fitted sports bras may have been a 7 on purchase intent to a female rater and a 1 on purchase intent to a male rater. Therefore, inter rater reliability was not assessed for purchase intent.

4.2.2 Idea Novelty / Originality

The ideas generated by the subjects were evaluated for their novelty / originality, meaning how unique the idea is in comparison to other products currently on the market. Once again, the rating was done by 7 bachelor thesis students. We were suitable raters of novelty of ideas because due to our backgrounds in International Business Administration we can be considered experts in the field. Idea novelty was assessed across a 7-point Likert scale, with 1 being very unoriginal, 4 being neutral, and 7 being very original. The idea descriptions were again provided anonymously, and all ideas were assessed on novelty by all 7 raters.

Inter-rater reliability was deemed important for the novelty / originality dimension, as the more consistency there was in the rater's assessment of the products' novelty, the more likelihood the product idea truly was novel compared to what is currently available in the student fitness market. A new data set was then created which only included the ideas which had a novelty variance of less than 6. This allowed for a Cronbach's alpha, for idea novelty, of .839, which can be seen in Table 1. Meaning that the inter-rater reliability across novelty was very good.

Table 1. Reliability Statistics – Novelty

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.839	.839	7

4.2.3 User Value / Usefulness

Finally, the ideas generated by the subjects were also evaluated for their user value, meaning how well the product idea fulfils an unmet need, or fulfils an existing need of the end user, better than the products currently available. Like the first two dimensions, the rating was done by 7 IBA thesis students, who can be considered as experts in the field. User value was rated along a 7-point scale, with 1 being very useless to user, 4 being neutral, and 7 being very useful to user. The ideas were provided anonymously, and all ideas were assessed on user value by all 7 raters.

Unlike purchase intent, which was rated based on the rater's individual intention of purchasing the product, user value was rated based on how useful the product would be to the specific end user. For example, an individual rater may have no intention to purchase boxing gloves because they do not box. However, they will be aware, and rate accordingly, that as a product, boxing gloves are very useful to the end user, who purchases them with the intent of using them to box. Therefore, a high inter-rater reliability for the dimension of user-value is desirable. A new data set was then created which only included the ideas which had a user value variance of less than two, as well as a novelty variance of less than 6. This allowed for a Cronbach's alpha, for user value, of .736, which can be seen in Table 2. Meaning that the inter-rater reliability across user value was good.

Table 2. Reliability Statistics – User Value

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.736	.742	7

5. ANALYSIS

5.1 Data Analysis

Within the context of this research paper, the independent variable is 'the level of anonymity'. This lone independent variable has 3 conditions to be manipulated, these are no anonymity, selective anonymity, and full anonymity. In this context, level of anonymity can be considered a categorical, specifically a nominal, variable. Meaning that there are two or more categories without intrinsic ordering of the categories. The dependent variable in this research is 'the quality of best idea'. This variable can be considered continuous as idea quality is a score given by judges, but the numerical value is not necessarily discrete. Finally, the moderator variable discussed in this paper is creative self-efficacy. This moderator variable can also be considered as a continuous variable, for the same reasons as the dependent variable. A moderator is a quantitative or qualitative variable that affects the strength and / or direction of the relationship between an independent variable and a dependent variable (Baron & Kenny, 1986). In other words, if an interaction variable was found to be significant, then the moderator variable does have an influence on the relationship between the independent and dependent variable

The ideas considered in the data analysis were contrived from the original data set, which contained 457 ideas to start with. The original data set was first cut down by discarding irrelevant ideas, then by discarding ideas which did not meet the inter-rater reliability criteria, this left a total of 303 relevant cases. Finally, a new and final data set was created which contained only the best quality idea per participant. This left a final data set containing 104 cases of best quality ideas. This left 43 cases from the selective anonymity condition, 28 cases from the non-anonymous condition, and 33 cases from the anonymous condition.

The first method of data analysis conducted was a one way between groups ANOVA-test. This test was used in order to test for a main effect between the independent and dependent variables. ANOVA is used when there are means from more than two groups to be compared. In other words, if significance is found using ANOVA, this tells us that there is statistically significant difference in at least one group mean. However,

which group that is, cannot be distinguished, hence more testing is required.

Next, for further investigation, into main effects, Independent Sample t-tests were ran. Unlike ANOVA, t-tests can only be ran using dichotomous variables. Therefore, three dummy variables were created for selective-anonymity or not, full-anonymity or not, and no-anonymity or not. Three separate independent sample t-tests were ran for each dummy variable. To elaborate, the t-test examines whether the means of two groups differ from one another, with statistical significance, meaning that we can distinguish the group which differs from the other two.

Finally, to test for moderation effect linear regression was used. "X's effect on Y is said to be moderated by W if the size or sign of X's effect on Y varies with W." (Hayes & Rockwood, 2017). In this case, X is the level of anonymity / scenario, Y is the idea quality and W is creative self-efficacy. Regression involved using the already created dummy variables as well as creating new variables to represent the interaction effect, which were a product of creative self-efficacy and each dummy variable, to give three new variables called 'Selective anonymous x Self-efficacy', 'Anonymous x Self-efficacy', and 'Non anonymous x Self-Efficacy'. For a true moderation / interaction effect to be present the moderator variable should not be correlated with the independent variable (Baron & Kenny, 1986). We can confidently say that an individual's belief in their own creative ability is not correlated with the level of anonymity in a brainstorming task. The results of these tests can be found in the following section.

5.2 Results

It is important to start this section by stating the difference in a main effect and a moderation / interaction effect. When looking at the effect of just one independent variable on a dependent variable, that is known as a main effect. Whereas, when looking at the effect of multiple independent variables, meaning that a change in level of anonymity does not affect the level of creative self-efficacy and vice versa, on the dependent variable then that is known as an interaction effect. Furthermore, it is possible for a statistically significant moderation effect to be present even if a statistically significant main effect is not present.

5.2.1 Main Effect

In order to answer hypothesis 1a, the first step of the data analysis process was to search for a main effect on the relationship between the independent and the dependent variable, in other words, the level of anonymity and the quality of the best ideas. A one-way ANOVA-test was ran, which resulted in (F (2,101) = .094, p = .910), which can be seen in Table 3. Within this research a significance of 10% was used, meaning to find significance the p-value must be equal to or less than .10. Therefore, no significant main effect was found, and we cannot say that the three conditions have statistically significant different effects on idea quality, to one another. In turn, hypothesis 1a is rejected.

Table 3. ANOVA – Main effect between scenario and idea quality

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.057	2	.029	.094	.910
Within Groups	30.705	101	.304		
Total	30.763	103			

One further step was then taken in the search for a main effect. Unlike ANOVA which requires three or more populations, a t-test can be used to determine whether two conditions are statistically different from one another. Therefore, three dummy variables were created in order to run three different t-tests. This step may seem redundant since the ANOVA test found no significant difference between any of the groups. However, it was decided this step would still be taken in order to ensure the t-tests did not find something different to the ANOVA test. In other words, to double check that no main effect was present. Also, a t-test on 'selective anonymity' and 'other' was required to definitively answer hypothesis 1b.

Firstly, the variable 'dummy anonymous' was created. In which 'anonymous' = 1 and 'other' = 0, with 'other' including the conditions of no-anonymity and selective anonymity. The anonymous group (M = 4.05, SD = .527) generated on average approximately the same quality of best ideas as did the 'other' group (non-anonymous and selectively anonymous) (M = 4.01, SD = .558). The results found were (t (102) = .394, p = .694), which can be seen in Table 4. Therefore, no significance was found meaning there is no statistically significant difference in quality of best idea between the condition of anonymity and the condition of other.

The next t-test was on variable 'dummy not anonymous'. The not anonymous group (M = 3.99, SD = .448) generated on average approximately the same quality of best idea as did the 'other' group (M = 4.03, SD = .581). As can be seen in Table 5, (t (62.249) = -.377, p = .708). Once again, no significance was found.

Finally, a t-test was ran on variable 'dummy selective anonymous', the output for this test can be seen in Table 6. The group selective anonymous (M = 4.02, SD = .625) generated on average approximately the same quality of best idea as did the 'other' group (M = 4.03, SD = .489). The results of the test were (t (76.164) = -.068, p = .946). Once again, for the third and final t-test, no statistically significant main effect was found. Therefore, hypothesis 1b is rejected.

All three of the t-tests showed no statistically significant difference between any of the populations. This backs up what was already found by the ANOVA-test. Therefore, to reiterate once again, hypothesis 1a and 1b are rejected. No statistically significant main effect can be found between the level of anonymity / scenario and the quality of best idea. Also, selective anonymity does not produce a higher quality of best ideas than the other two conditions.

Table 4. Independent Samples Test – Anonymous

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	1.053	.307	.394	102	.694	.04557	.11561
Equal variances not assumed			.403	65.916	.689	.04557	.11317

Table 5. Independent Samples Test – Not Anonymous

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	2.911	.091	-.334	102	.739	-.04058	.12134
Equal variances not assumed			-.377	62.249	.708	-.04058	.10772

Table 6. Independent Samples Test – Selective Anonymous

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	6.585	.012	-.071	102	.943	-.00778	.10935
Equal variances not assumed			-.068	76.164	.946	-.00778	.11404

5.2.2 Moderation Effect

As previously stated, a moderation effect can be present regardless of whether a main effect is present. Therefore, the next step was to create the variables required for a moderation analysis through linear regression. The dummy variables had already been created for the t-tests. In order to answer hypothesis 2, 3, and 4 new variables were required to represent the interaction between the independent variables. The first being the product of 'dummy anonymous' and creative self-efficacy, which was called 'Anonymous x Self-efficacy', and the second being a product of 'dummy selective anonymous' and creative self-efficacy, which was called 'Selective anonymous x Self-efficacy'. Finally, the third being the product of 'dummy non anonymous' and creative self-efficacy, which was called 'Non anonymous x Self-efficacy'.

To answer hypothesis 2, linear regression was ran using 'dummy anonymous' and 'Anonymous x Self-efficacy' as independent variables and 'idea quality' as the dependent variable. The output of this test can be seen in Table 7. However, 'Anonymous x Self-efficacy' returned (B = .003, p = .975), meaning there is not a significant interaction effect, and so creative self-efficacy does not significantly impact the relationship between anonymous brainstorming and the quality of best idea. Hypothesis 2 states, "*As creative self-efficacy increases, the impact of anonymous brainstorming on quality of best ideas will not change significantly"*, therefore we do not reject hypothesis 2.

To answer hypothesis 3, linear regression was ran using 'dummy selective' and 'Selective anonymous x Self-efficacy' as independent variables and 'idea quality' as the dependent variable. The full output of this test can be seen in Table 8. 'Selective anonymous x Self-efficacy' returned (B = .181, p = .048). Therefore, a positive and significant interaction effect is found. Meaning as creative self-efficacy increases, per unit, so does the impact of selective anonymity, by .181%, on the quality of best ideas. Hypothesis 3 states, *"As creative self-efficacy increases, so will the impact of selective anonymity on quality of best ideas",* we therefore do not reject this hypothesis.

To answer hypothesis 4, linear regression was ran using 'dummy non anonymous' and 'Non anonymous x Self-efficacy' as independent variables and 'idea quality' as the dependent variable. The output of this test can be seen in Table 9. 'Non anonymous x Self-efficacy' returned (B = -.207, p = .034). Therefore, a negative and significant interaction effect is found. Meaning as creative self-efficacy increase, per unit, the impact of anonymity decreases, by .207%, on the quality of best ideas. Hypothesis 4 states, *"As creative self-efficacy increases, so will the impact of non-anonymous brainstorming on quality of best ideas",* we therefore reject this hypothesis.

To help with interpretation and understanding of the results, Figure 2 can be used. This is a graph, plotted using SPSS, showing a graphic depiction of the strength and directions of all three of the interaction effects. Scenario 1, depicted with a blue line, is the anonymous scenario. Scenario 2, depicted with a green line, is the non-anonymous scenario. Finally, scenario 3, depicted by the yellow line, is the selective anonymous scenario.

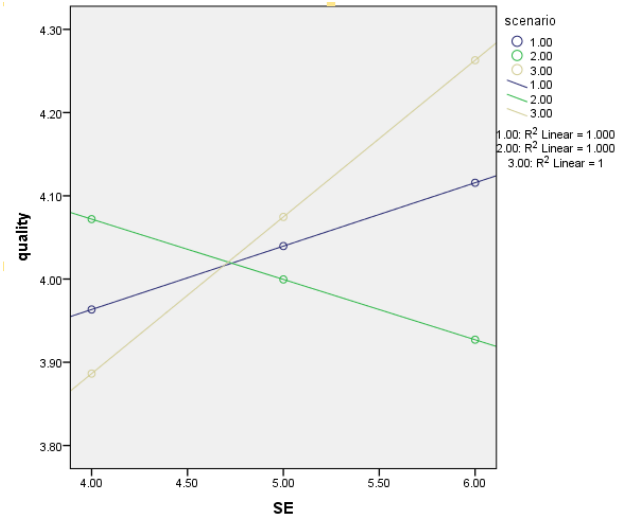

Figure 2. Interaction Effects

6. DISCUSSION AND IMPLICATIONS

6.1 Main Effect

The analysis of variance conducted between the three anonymity conditions did not prove any significant difference in the average quality of best ideas produced by participants in anonymous, identifiable, and selectively anonymous brainstorming conditions. Throughout this paper it was hypothesised that selectively anonymous brainstorming would be a superior method of brainstorming to anonymous and identifiable brainstorming, but this was not able to be proven through direct main effect. It can be seen in the results chapter that all three scenarios returned, on average, quality of best idea scores of approximately 4. Therefore, as stated previously, hypothesis 1a and 1b were rejected. An explanation for this may be that the level of anonymity has no direct effect on quality of best ideas produced. However, the small number of ideas per scenario might restrict the effectiveness of the study, and so a repeat of the study with a greater number of participants could provide more information to either agree with or contradict what was found in this study.

6.2 Moderation Effect

Through moderation analysis it was discovered that creative self-efficacy does not impact the effect of full anonymity on quality of best ideas. An explanation for this may be that anonymity reduces the evaluation apprehension of people with lower belief in their creative abilities, which allows for them to comfortably express their more unconventional, in other words original, ideas. Which, in turn, increases the quality of their best ideas produced. While on the other hand, the lack of identifiability and acknowledgment may demotivate the efforts of the people with higher belief in their creative ability. Meaning that anonymity creates a level playing field for all participants regardless of their level of creative self-efficacy. Hence why creative self-efficacy does not impact the effect of full anonymity on quality of best ideas.

Although a main effect was not found, a positive moderation effect was found between creative self-efficacy and selective anonymity on the outcome of quality of best ideas. Meaning that, the more positive creative self-efficacy becomes, the more positive the effect of selective anonymity on quality of best ideas become. An explanation for this may be that the combination of safety from judgement and motivation of potential acknowledgement, that is provided only by selective anonymity, engages with levels of intrinsic motivation which increase as

Table 7. Linear Regression – Anonymous

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	3.653	.270		13.520	.000
Self-efficacy	.073	.054	.163	1.353	.179
Anonymous scenario	.006	.497	.005	.012	.990
Anonymous x Self-efficacy	.003	.095	.014	.032	.975

Table 8. Linear Regression – Selective Anonymous

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	3.986	.296		13.453	.000
Self-efficacy	.008	.056	.017	.136	.892
Selective scenario	-.853	.453	-.772	-1.881	.063
Selective anonymous x Self-efficacy	.181	.090	.807	1.997	.048

Table 9. Linear Regression – Non anonymous

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	3.375	.257		13.123	.000
Self-efficacy	.134	.051	.300	2.636	.010
Non anonymous scenario	.987	.500	.805	1.974	.051
Non anonymous x Self-efficacy	-.207	.096	-.892	-2.144	.034

creative self-efficacy increases, to form a beeline of motivation and freedom of expression which can only be experienced in selective anonymity. Hence why the effect of selective anonymity on quality of best idea is positively impacted creative self-efficacy.

Research from Gong et al. (2009) and Tierney and Farmer (2002) found higher creative self-efficacy to produce higher quality of creative outcome. Leading from this, hypothesised in this paper was that due to higher levels of intrinsic motivation, people with higher creative self-efficacies would create higher quality output regardless of the anonymity condition. At the rejection of hypothesis 4, this appears to not be the case. The results of moderation analysis on the interaction between creative self-efficacy and non-anonymous brainstorming showed a significant negative moderation effect on the quality of best ideas. Meaning the more positive creative self-efficacy becomes, the more negative the effect of identifiability on quality of best ideas. This was a surprising outcome and one that is difficult to develop an explanation for. Further research may be needed to explain these results.

6.3 Theoretical Relevance

One of the aims of this paper was to introduce selective anonymity into literature as a new method of brainstorming. A clear definition for selective anonymity is given in the text, and a clear description of its use within a research setting is also given. Therefore, this aim can be considered achieved. Furthermore, this paper brings a new perspective to current literature. That is of creative self-efficacies moderating effect on the relationship between conditions of anonymity and performance outcome, more specifically idea quality. This paper presents some interesting findings, and one unexpected finding in the rejection of hypothesis 4. Therefore, there is a basis and comparison for future research, within the area of brainstorming and creative self-efficacy, to work from.

6.4 Practical Relevance

Due to companies increasingly utilising a wider variety of stakeholders, as opposed to just an internal creative team, in their idea generation processes (Annosi et al., 2022), the individuals' creative self-efficacy becomes a relevant factor. In order for companies to understand how to get the best results out of their brainstorming participants, this paper aimed to find out how levels of anonymity could be utilised to increase the quality of outcomes based on a person's creative self-efficacy. Based on the results of this research, it would be advised to managers, that when faced with a group of randomly selected stakeholders to conduct idea generation with, make use of selective brainstorming. Due to the lack of knowledge about these people's levels of creative ability, or more importantly their perceptions of their level of creative ability, selective anonymity has been shown in this paper to have the best positive interaction effect on quality of best ideas.

6.5 Limitations

The main limitation is the setting of the data collection. All participants partook in the idea generation process electronically and remotely, regardless of whether their condition was non-anonymous, fully anonymous, or selectively anonymous. The electronic and remote nature was beneficial in order to provide full anonymity, as full anonymity is harder to provide in a face-to-face setting. Furthermore, this setting was also beneficial for the selectively anonymous condition as it allowed for anonymity when required and identifiability when required. However, the electronic and remote nature of the task may have hindered the effectiveness of the non-anonymous / fully identifiable condition. This is because the lack of face-to-face communication still does provide a degree of anonymity to the participant. Although their name would be revealed along with the ideas they provided, this was only after the task was complete, and a name without a face is not fully identifiable. In order to have a truly non-anonymous condition, participants would ideally have undertaken the brainwriting task and the idea / identity reveal in a face-to-face setting. Leaving only the fully anonymous and selectively anonymous participants to access the task remotely.

A minor limitation that may have been present throughout this study was the fact that the participants were aware of traceability. Because the study was completed by students who accessed the study through their university portal, they will have been aware that the survey they completed could be traced back to them. This may have slightly inhibited the answers given by the participants of the fully anonymous condition, as they may not have believed the survey to be truly fully anonymous.

6.6 Further Research

As stated in the limitations section of this paper, a slight degree of anonymity can be considered to have been present in the non-anonymous condition of the data collection. For future research, it would be advisable to adjust the setting of the data collection to ensure more accurate conditions. A potential option, for the same experiment but with adjusted settings, would be to keep the setting the same for participants of the fully and selectively anonymous conditions, but to have an in-person, face-to-face setting for the participants of the non-anonymous condition. The actual idea generation task would continue to be done silently and individually, due to the brainwriting nature of the task, but the presenting of ideas and identities can be done in front of the fellow participants, to ensure for full identifiability. Alternatively, idea generation can be done remotely beforehand, and participants are only brought together for the presenting of the ideas / identities, this may be an equally effective but more time-conscious option.

Furthermore, for future research which is specifically enquiring into creative self-efficacy moderating the relationship between level of anonymity and idea quality, or even quantity, there is the possibility to develop the data collection methods used in this paper. For example, comparison between groups of people who are considered to have low creative self-efficacy versus groups of people considered to have high creative self-efficacy, and how the different levels of anonymity provide results.

Finally, further research into this topic could involve the inclusion of a mediation variable. For example, free-riding or evaluation apprehension. This research may be relevant because level of anonymity can have an effect on these variables. For example, as the level of anonymity is increased the level of evaluation apprehension will likely go down, but the likelihood of free riding taking place will increase as anonymity increases. Furthermore, these variables may be fitting with creative self-efficacy as one can assume that a person with high creative self-efficacy will have low evaluation apprehension, regardless of the level of anonymity, and will be less inclined to free-ride, due to their intrinsic motivation and confidence in their creative abilities. Whereas a person with low creative self-efficacy will likely have high levels of evaluation apprehension when anonymity is not present but may be more likely to free ride when anonymity is present.

7. CONCLUSION

In an attempt to answer the research question posed at the beginning of this paper, research was conducted into the effects of three different anonymity conditions on the quality of best

ideas produced and how those conditions interact with creative self-efficacy to impact the quality of best ideas produced.

To reiterate, the research question of this paper is, "*What impact does creative self-efficacy, as a moderating variable, have on the relationship between the level of anonymity and the quality of best ideas?"*

This paper is concluded with the answer to the research question. No condition proved to be superior to the others based off direct effect on quality of best ideas. Furthermore, creative self-efficacy was not found to have a moderating effect on the relationship between anonymous brainstorming and quality of best ideas. However, creative self-efficacy was found to positively strengthen the relationship between selective anonymity and quality of best ideas. Finally, it was found that the more positive creative self-efficacy became, the more negative the effect of non-anonymous brainstorming on quality of best idea became. Overall, the study had some interesting findings which can be used as a comparison for future research to build on.

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APPENDIX

Appendix A. One way ANOVA for main effect between independent and dependent variable

Oneway

Descriptives

idea_quality

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 anonym	33	4.0534	.52696	.09173	3.8665	4.2402	3.14	5.38
2 nicht-anonym	28	3.9926	.44782	.08463	3.8190	4.1663	3.06	5.06
3 selektiv-anonym	43	4.0177	.62497	.09531	3.8254	4.2101	2.67	5.33
Total	104	4.0223	.54650	.05359	3.9160	4.1286	2.67	5.38

Test of Homogeneity of Variances

idea_quality

Levene Statistic	df1	df2	Sig.
3.386	2	101	.038

ANOVA

idea_quality

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.057	2	.029	.094	.910
Within Groups	30.705	101	.304		
Total	30.763	103			

Appendix B. Independent Samples t-test for main effect between dummy variable anonymous and dependent variable

T-Test

Group Statistics

	anonymous scenario=anonym	N	Mean	Std. Deviation	Std. Error Mean
idea_quality	1	33	4.0534	.52696	.09173
	0	71	4.0078	.55844	.06627

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
idea_quality	Equal variances assumed	1.053	.307	.394	102	.694	.04557	.11561	-.18375	.27489
	Equal variances not assumed			.403	65.916	.689	.04557	.11317	-.18039	.27152

Appendix C. Independent Samples t-test for main effect between dummy variable not-anonymous and dependent variable

T-Test

Group Statistics

	not_anonymous scenario=nicht-anonym	N	Mean	Std. Deviation	Std. Error Mean
idea_quality	1	28	3.9926	.44782	.08463
	0	76	4.0332	.58097	.06664

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
idea_quality	Equal variances assumed	2.911	.091	-.334	102	.739	-.04058	.12134	-.28126	.20010
	Equal variances not assumed			-.377	62.249	.708	-.04058	.10772	-.25589	.17473

Appendix D. Independent Samples t-test for main effect between dummy variable selective-anonymous and dependent variable

T-Test

Group Statistics

	selective scenario=selektiv-anonym	N	Mean	Std. Deviation	Std. Error Mean
idea_quality	1	43	4.0177	.62497	.09531
	0	61	4.0255	.48916	.06263

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
idea_quality	Equal variances assumed	6.585	.012	-.071	102	.943	-.00778	.10935	-.22468	.20911
	Equal variances not assumed			-.068	76.164	.946	-.00778	.11404	-.23491	.21935

Appendix E. Linear regression for moderation analysis - Anonymous

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.169[a]	.028	-.001	.54668

a. Predictors: (Constant), Moderatoranon, SE, dmyanon

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.876	3	.292	.977	.407[b]
	Residual	29.886	100	.299		
	Total	30.763	103			

a. Dependent Variable: quality

b. Predictors: (Constant), Moderatoranon, SE, dmyanon

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.653	.270		13.520	.000
	SE	.073	.054	.163	1.353	.179
	dmyanon	.006	.497	.005	.012	.990
	Moderatoranon	.003	.095	.014	.032	.975

a. Dependent Variable: quality

Appendix F. Linear regression for moderation analysis – Selective anonymous

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.257[a]	.066	.038	.53603

a. Predictors: (Constant), SE, Moderatorselec, dmyselct

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.029	3	.676	2.354	.077[b]
	Residual	28.733	100	.287		
	Total	30.763	103			

a. Dependent Variable: quality

b. Predictors: (Constant), SE, Moderatorselec, dmyselct

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.986	.296		13.453	.000
	dmyselct	-.853	.453	-.772	-1.881	.063
	Moderatorselec	.181	.090	.807	1.997	.048
	SE	.008	.056	.017	.136	.892

a. Dependent Variable: quality

Appendix G. Linear regression for moderation analysis – Non anonymous

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.270[a]	.073	.045	.53408

a. Predictors: (Constant), Moderator_non_anon, SE, dmynotan

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.239	3	.746	2.616	.055[b]
	Residual	28.524	100	.285		
	Total	30.763	103			

a. Dependent Variable: quality

b. Predictors: (Constant), Moderator_non_anon, SE, dmynotan

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.375	.257		13.123	.000
	SE	.134	.051	.300	2.636	.010
	dmynotan	.987	.500	.805	1.974	.051
	Moderator_non_anon	-.207	.096	-.892	-2.144	.034

a. Dependent Variable: quality