Master Thesis - Thesis Hub Master Economics & Business– FEM61007

The Innovation Selection Process: The Formation of Creative Forecasting

Erasmus School of Economics - 04-08-2021

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Executive Summary

To be able to implement the best ideas for a firm it is not enough to only come up with innovative ideas. Selecting the best ideas out of a pool of ideas is equally, if not more, important. It would be a waste of energy, time and opportunity to come up with great ideas only to not select the best ones. This study investigates how to increase the idea selection performance, more specifically, how to select the best ideas from concepts that include one's own and others' ideas. On top of that, the research examines if the following variables influence the idea selection performance: involvement in idea generation, exposure to feedback on generation performance, adopting an optimistic attitude and being competitive. To test for these effects an experiment is set up between three groups. The first group only select ideas, the second also generates ideas and the third generates and selects ideas with a manipulation in mid-experiment. Results suggest that there is only a significant negative effect for involvement in idea generation if one adopts a positive attitude, whereas the other variables have no significant effect on the idea selection performance. However, in some cases, it does make difference to add one's own idea to the pool of the to be selected ideas to increase the selection performance. On top of that, sometimes choosing one's own idea does improve the idea selection performance. The last impressing results is that idea evaluations have no impact on the idea selection performance.

Table of contents

Executive Summary 2

Table of contents 3

1. Introduction 6

1.1 Problem Description 6

1.2 Research Question 7

1.3 Academic Relevance 9

1.4 Managerial Relevance 11

1.5 Structure of the Thesis 12

2. Literature Review 13

2.1 Characteristics of innovative companies and their tools 13

2.2 Methods for improving the idea generation and - selection process 15

2.3 Experts vs freshmen 17

2.4 Intuitive vs deliberative assessments 18

2.5 Hierarchy & idea selection 19

2.6 Biases 21

2.7 Conceptual Model & Hypotheses 27

3. Research Methodology 31

3.1 Research Design 31

3.2 Participants 31

3.3 Method 32

3.4 Problem 33

3.5 Procedure 34

3.6 Pre-test 35

3.7 Variables and their measurements 37

3.8 Model Equation 39

4. Data Analysis and Results 41

4.1 Assumptions of linear regression 41

4.2 Output of the linear regressions 43

4.2.1 Model 1 & 2 Output 43

4.2.2 Model 3 & 4 Output 44

4.2.3 Model 5 & 6 Output 47

4.3 Top 3 Idea Selections 52

4.4 Correlational effects of the evaluations on the selection 53

4.5 Own idea evaluations along the survey 55

4.5.1 Non-Exposure Group 55

4.5.2 Exposure-Group 56

4.6 Including one's own idea in the to be selected ideas 57

4.7 The role of experience 59

4.8 Selecting between one's own and others' ideas 60

4.8.1 In the NEG 60

4.8.2 In the EG 62

5. Conclusion and Discussion 64

5.1 General Discussion 64

5.2 Academic Contribution 66

5.3 Managerial Implications 68

5.4 Limitations and Directions for Future Research 69

6. Appendix 71

6.1 Experiment set-up 71

6.2 Explanatory figures and tables 80

6.3 Assumptions of Multiple Linear Regression 81

7. References 84

1. Introduction

1.1 Problem Description

Firms are facing unique challenges in the business world on a daily basis and with different methods they are trying to overcome them. For companies to survive in a business world full of fierce competition they are required to invest in new product development. At the same time, such selections on innovation decisions are by their nature made under high risk (Goldenberg, Lehmann & Mazursky, 2001). By improving innovative activities within a company, such as developing new products from scratch or adding new features to an already existing product, a competitive advantage can be obtained. One way to reduce the risk in the idea implementation process is by carefully selecting new product ideas that are potentially successful. It is crucial for firms to efficiently screen through a pool of ideas, as after the idea generation process, a company can easily be left with hundreds of ideas generated (Toubia & Florès, 2007). Therefore, the ability to pick the most appropriate one is of significant importance as it is unfeasible for most companies to realize them all.

Even though the great importance of innovation for firms cannot be denied, it still seems a lot of firms are struggling to come up with unique ideas and implementing them. From idea generation to idea selection to idea realization, it requires many steps before an actual product can be innovated. Companies whose success depends on creativity such as design consultancy IDEO are a great example when it comes to handling different challenges by generating innovative ideas (Amabile & Khaire, 2008). The company is founded in 1991 with an initial focus on product design and engineering. What made them special compared to their competitors in the design industry is their human-centered approach. IDEO integrated the needs of users in their design thinking: a human-centered approach to innovation. The IDEO team even collected data to find the right innovative

solution by moving to another country and conducting field experiments. After the field experiments, they have brainstorm sessions to gather as much perspectives as possible and come up with the right solution. They run the sessions with the customer itself to help them know how the market in another culture works. However, how do we know if they choose the best option out of the pool of ideas?

It turns out that for many companies the ability to create new ideas is not the part they stumble. The bigger problem appears to be the selection of the best possible option amongst many alternative concepts, which is why firms miss out on great opportunities or make costly investments (Fuchs, Sting, Schlickel, & Alexy, 2019). How do companies reflect on totally new ideas and how should they respond? Based on which criterion do they select the best one?

1.2 Research Question

Like mentioned before, after gathering new concepts for innovative activities, a firm is forced to narrow down the choices out of a great subset of ideas. This is done in a short amount of time without knowing if they are selecting the right ones. By nature, selection decisions for innovation are being made under conditions of high uncertainty. It is almost impossible to collect enough information early on the stage to enable an unmistakable choice. This means that it is difficult to assemble 'facts' to make a clear business choice.

Many researchers in a wide range of areas have presented various approaches for improving the methods used to minimize inefficiencies along the idea selection process. Every organization has its unique way to make end-decisions in picking the most innovative idea. For some companies, for example in a proprietorship, the person who generated the ideas is often also the one who selects the best idea possible out of all ideas. Others, like well-established companies with tens of employees, have the choice to move the responsibility for decision making to others. The choice to decide on the best idea can be given to

groups, managers, bosses and obviously also to an external party like a consultancy firm. The question that arises is whether it is important for companies, big or small, to account for the person or group they keep responsible for the idea selection process. Specifically, this research focuses on how it makes a difference if a person has to choose between his or her own idea compared to the ideas of others. Do people prefer their own idea above others, even if theirs is less creative? Is this because they do not see the same potential in the product as the person who conceptualized it or is it because of feelings of greed and jealousy?

This study focuses on if the person involved in idea generation should be the decision maker in selecting an idea. Therefore, the research question for this study is as follows: How does selecting between an own idea versus others' ideas influence the idea selection performance? The corresponding sub-questions that are to be examined in the research are stated below. The first sub-question is elaborated on in the literature reviews, while the answers to the remaining two sub-questions are provided in the results section.

1. Which factors influence the innovation selection process?

2. How does including one's own idea in a pool of others' ideas impact the ability to select high-quality ideas?

3. What is the role of experience on the ideation process?

1.3 Academic Relevance

Performance differences between firms are generally attributed to organizational factors rather than to differences among individuals in firms. As a result, little is known about the role firm members play in explaining the variance in performance among firms (Mollick, 2012). The purpose of this research is to partake in the contemporary stream of research in creative idea selection and to contribute by facilitating new insights about potential individual decision-making behavior. In particular, the aim of this research is to deepen our understanding of creative forecasting by combining literature on role design and biased idea evaluations. The ability to see opportunities in a product as well as psychological and emotional aspects are to be investigated to control for distortions and biases. The study, hereby, presents a new perspective on the creativity paradox of why organizations desire but often reject creative ideas. This is done by identifying if the idea generator is suitable for making end-decisions about the best possible idea from concepts that include others' ideas and an own idea.

Building on the work of Berg (2016) on the effect of creators' and managers' roles in creative forecasting, this research is of high relevance in two ways. Berg (2016) conducts two experiments that both reach the conclusion that individuals in creator roles are more likely to give promising novel ideas the support they deserve than individuals in manager roles. The first study tests creators for their skills to generate ideas and for managers to select ideas, whereas the hybrids are tested on both. The emphasis here is that all groups are highly involved in the circus industry, as they are either experienced circus artists or producers.

This research also investigates the relationship of forecasting others' ideas and personal ideas on the idea selection performance. However, the groups that participate in this study consist of laypeople that do and do not generate ideas before the idea evaluation. So, the first contribution to the existing literature is

that the people who generate as well as select ideas consist of lay-people, that is, people without actual experience or a high corporate position, rather than highly experienced managers or creators.

The second experiment controls for individuals, that are assigned to either a creator, manager or hybrid role, on their ability in creative forecasting. All groups generate ideas before ranking the ideas. The participants are composed of university students, which makes it look like laypeople in a creative forecasting context are already been investigated on. However, the creative ideas that are generated by the participants are not incorporated in the set of ideas that are been ranked on. This is the second contribution to existing literature. In short, this study builds on prior work by combining the two studies of Berg (2016) into one. It is a mix of both studies in which both laypeople generate ideas and the own ideas are included in the selection process.

Additionally, the study tests if and why people tend to choose their own idea above others' ideas even when others' ideas are more innovative. Do people misunderstand and underrate ideas of others because they do not see the additional value it can create or because they are unable to bear that the ideas of others are better?

This paper provides new insights for the stream of research on biased idea evaluations, also known as the ideator's bias. The ideator's bias can also be defined as individuals that err systematically when forecasting the value of their own ideas (Fuchs et al., 2019). As existing literature states that it is likely for idea generating individuals to overvalue the success of their own ideas (Dane, 2010), this study sheds light on how personal feelings towards one's own idea and others' ideas impact the idea selection performance through an optimistic and competitive attitude. In this respect, it is to be examined if behavioral errors emerge that affect the idea selection performance.

In this research the focus lies on comparing within groups of the lower organizational level class, rather than comparing low - versus high organizational level employees like Fuchs et al. (2019) did. The third contribution to previous research is, hence, the investigation on the ideator's bias within the lower class implying that a new area on biased idea evaluations is studied.

Thus, for the purpose of enriching our understanding on the idea selection performance, laypeople and the lower organizational class are researched. In other words, the study provides further research with an initial base of evidence to build on regarding the function of experienced feelings on the innovation selection process of one's own and others' ideas.

1.4 Managerial Relevance

First of all, this thesis is relevant for managers, since the head of a company should be able to tell whether it is wise to let an idea be rated by the person who came up with the idea or by someone other than this person when selecting ideas from concepts which include others' ideas and one's own idea. Specifically, managers can retrieve information out of this paper to understand if lower organizational level employees should be included in the idea generating process, idea selecting process or both of them.

Secondly, the rejection of creative ideas still remains a challenge within organizations. By understanding if one chooses his own ideas before others', even when it is less innovative, decision makers can prevent situations in which someone proposes their own ideas to be implemented by prohibiting them to do this. By having a greater understanding of individual behavior in the innovation selection process, managers can control for behavioral errors to avoid them, which makes the probability of success with the certain innovation higher. This also leads to improving the performance in the area of idea selection.

All in all, this study provides managers guidelines for the decision-making process of the selected innovative idea by indicating by whom an idea should be approved. They get to know whether or not it is effective to exclude the idea generator from the idea selection process for the sake of choosing the idea of the best quality. They also come to understand if individuals are biased in the decision-making of an innovative idea or not, because they are tended to downgrade ideas of others before their own ideas. If so, managers can avoid this bias by prohibiting his employees to select their own idea.

1.5 Structure of the Thesis

The thesis is built up in the following way. In the first place, the main problem and research question are discussed, which are followed by the sub-questions. The next section provides a review on the current literature and its findings. For clarification purposes, the third section consist of the research methodology to explain the set-up of the main experiment. The fourth section is composed of the analysis of the data followed by the results. Last but not least, the paper ends with a conclusion and discussion section in which the main findings, implications for management and practice and shortcomings are discussed.

2. Literature Review

This chapter reviews previous literature on the characteristics of innovative companies and their tools followed by methods to improve the idea generation and - selection process. In addition, the topic on the effect of hierarchy on idea selection is presented. Last but not least, biases around idea selection are outlined and the foundation is laid for creating the hypotheses and conceptual model.

Firstly, according to Girotra et al. (2010) ideas are defined as a number of possible solutions to a problem. Whereas Kornish & Hutchison-Krupat (2017) define ideas as discrete or enumerated descriptions of solutions to a problem posed.

A common approach to innovation is to identify a large number of opportunities and then to select a subset for further development, with just a few coming to fruition (Kornish & Ulrich, 2011). Idea selection represents a critical stage in new product development, one that helps prevent wasteful investments (Prandelli et al., 2006). For a long time, the problem was thought to be how to generate creative ideas. Now, there is lots of literature available about the generation process (Berinato, 2014). However, the important challenge is how to make sure the chosen ideas are among the most creative ones in the first place. And is it guaranteed that the best ones are not filtered out? How can decision-makers improve this process? The literature review discusses the methods that are likely of most use for improving the idea selection process.

2.1 Characteristics of innovative companies and their tools

According to Hansen & Birkinshaw (2007) a company's capacity to innovate is only as good as the weakest link in its innovation value chain. It is possible for a firm to outperform others in identifying an idea of high quality, but they may be

poor at launching it to the market. Like this, others may have the financial capabilities and a good system to actually bring products to the market, but are low on product concepts. The research studies the innovation value chain to assess innovation performance. The value chain consists of the stages of idea generation, - conversion, and – diffusion. This framework provides insights of the innovation efforts in an organization. With this, organizations can pinpoint the weakest links in and across their units and tailor innovation practices properly to enhance them.

In his study Day (2007) describes two explicit tools that can improve the innovation decision-making process. These tools are the risk matrix and the R-W-W (“real,” “win,” “worth it”) screen. The risk matrix is able to provide the user with an estimate of the likelihood of success or failure of a project based on how big the challenge for a company is. Ultimately, according to the matrix, the risk of the project increases as familiarity with a product or market decreases. The second tool, the R-W-W screen, assists in reviewing the feasibility of a project by asking some essential questions. These questions include “’is it (product/market) real?”, “can we win?” and “is it worth doing?” and serve to identifying whether customers want the product and, if so, whether it can be built.

It is a classic assumption that the greater the number of ideas, the better the performance (Dahan & Mendelson, 2001). An additional comment on this made by Boudreau et al. (2011) is that the competitive effect of having a greater number of participants, in particular increased competition, is equal to less effort produced and thereby causing the quality of the idea to decrease. From the conclusions of both papers, the conclusion is drawn that it is more beneficial to have more ideas per participant.

Like this, Dahan et al. (2011) demonstrate the convenient usage of prediction markets in the idea selection process. In their experiment, groups of fifteen to twenty individuals are assembled with whom they use an online platform to share information and comment on each other's ideas. With this project they raise evidence on the predictive validity of direct group communication on idea selection. Prediction markets and direct group communication prove both to make better predictions than individually-made predictions.

One of the characteristics that innovative organizations possess is tolerance for failure (Hutchison-Krupat & Chao 2014). The results of Yuan and Woodman (2010) put perspective in this statement, since they support the thinking of "outcome expectations" being strong motivating forces that are driving innovative behavior. It turns out that innovation is partly determined by performance and image outcome expectations. These expectations can also be defined as the beliefs of employees in their own innovative efforts to improve performance that in turn create certain image gains.

In their first study Rietzschel, Nijstad & Stroebe (2010) conduct an experiment in which participants first generate ideas and in turn select their best idea. They derive that the generation of creative ideas does not automatically imply the selection of creative ideas. Furthermore, making participants thoroughly consider all their own ideas prior to an idea selection decision does not improve the performance significantly.

2.2 Methods for improving the idea generation and - selection process

Previous studies have emphasized on how to generate and realize new ideas. For example, the study of Girotra, Terwiesch & Ulrich (2010) investigates the idea generation process and the ability of the groups to discern the quality of the

ideas. They also test for the quality of the best idea. While most studies analyzes either an individual - or group brainstorming session approach in organizations, Girotra et al. (2010) introduce hybrid teams in which individuals first operate independently and then join forces together. They reach the conclusion that hybrid teams exceed in terms of performance rather than teams that merely work together.

Given the right circumstances, individuals are able to generate ideas that organizations are willing to implement (Kavadias & Sommer, 2009; Girotra et al., 2010). In addition to the findings of Girotra et al. (2010) regarding team performance, the findings of Kavadias & Sommer (2009) add another perspective to the contribution of groups in problem-solving. It appears that the benefit of group knowledge diversity is dependent on the type of problem that is to be solved by the group. On top of that, groups with various skills find better solutions to cross-functional problems relative to homogenous groups, however, this advantage diminishes as the complexity of the problem increases.

Ideation challenges often happen around the number and diversity of the idea pool (Kornish & Ulrich 2011; Erat 2017). Nonetheless, Baer (2012) argues that the connection between the creativity of ideas and their implementation is less straightforward than the connection between idea quantity and implementation. In his study Erat (2017) investigates the effect of the “structure” of idea pools and of learning across stages on the degree to which the top ideas are extraordinary. The key finding is that dissimilarity between ideas within a pool of ideas, also defined as dispersion, affects the value derived from the top ideas positively. Erat (2017) demonstrates that the dispersion of ideas in an idea pool is an important driver of the performance of the best idea.

The research of Goncalo & Duguid (2008) is based on predicting when the likelihood for groups to make more accurate decisions increases. The researchers

derive from the findings that attributions for past performance affect the quality of the decision made by the group. In order to make more accurate decisions managers should thus highlight the past successes of their co-workers. Concentrating on personal attributions softens the stress of individuals to fit in the prevailing group culture. This stimulates individuals to differentiate themselves from the group to bring out their own exclusivity.

2.3 Experts vs freshmen

Another stream of research is questioning who the appropriate person is to collect data from; the experts or the freshmen. Many researchers concluded that the predictions of experts are not necessarily of higher value than that of the freshmen (Hoch, 1988; Kornish & Ulrich, 2014). This is of great importance for this research, since the participants that contribute to the experiment exist of laypeople, in other words people without actual experience. Moreover, Kornish and Ulrich (2014) do state that for consumer products the stated intention of novice's is predictive of consumer's behavior and actual sales. In the same study they also reach the conclusion that the quality of the raw idea on innovative household goods accounts for only a small share of the variance in actual market outcomes.

Preliminary studies theorize that expertise should influence assessments of creativity and still there are an abundance of examples of experts in different positions who differ on whether the same idea is creative (Mueller et al., 2018). Firms launch ideas which are feasible, but which customers do not look forward to. To avoid any kind of risk, decision makers make themselves believe that consumers are not interested in novel ideas, even if they do. Even though long-standing theories claim that expertise is key in assessing creativity, current findings state that two individuals with the same expertise evaluate ideas

differently based on their mindset or feelings of uncertainty, which may be related to their position in the organization (Berinato, 2014).

Nishikawa et al. (2013) compared the actual market performance of user-generated versus designer-generated products. Drawing on a unique data set gathered from the Japanese consumer goods firm Muji, they are filling this gap in the literature. User-generated products, which are generally more novel, outperform the designer-generated products on key market performance metrics, including actual sales revenues. User-generated products also have a higher chance level in surviving the three-year test period than designer-generated products.

Most of all, the findings of Elsbach & Kramer (2003) mention that creativity assessment by experts in firms is, by far, a more complicated and dynamic process. The is because an expert's assessment of a target's creative potential are shaped by the use of internal and self-referential signals and also by how the judges categorize their relationships with the targets. The contradiction between the approaches can be comprehended within the framework of "sticky information", which highlights the fact that experts are more prone and responsive to "solution information" and consumers to "need information" (Von Hippel, 1994).

2.4 Intuitive vs deliberative assessments

Early evidence has revealed that an idea selection approach without manipulation yields below-optimal selection performance (Rietzschel et al., 2014). Even then, findings suggest that intuitive processing improves creative idea selection as it helps people to select better than chance level, whereas deliberative processing leads to an average selection performance.

In the innovation literature, the quality of ideas is often judged by the combination of concepts originality, feasibility and relevance. However, this does not imply that individuals in an experiment are also using these criteria during their selection (Rietzschel, Nijstad & Stroebe, 2010; MacCrimmon & Wagner, 1994). Individuals perform better at idea selection when the criteria "originality" and "feasibility" are introduced relative to giving them general instructions like having them to select the "best ideas" (Rietzschel, Nijstad & Stroebe, 2010).

According to Wilson and Schooler (1991) assessments that are made holistically produce better results than assessments based on purpose-driven thinking and decomposition. In many cases individuals do not know why they feel a certain way, however, they do know how they feel. When assessing an idea, participants judge it on a whole feeling. Asking participants to separately assess the idea on particular aspects can alter their way of detecting the idea. Analyzing motives can draw the attention to non-optimal conditions, which leads the future choices to be based on these conditions. On top of that, the study of Magnusson et al. (2014) explores that about 50 percent of unconscious thinking, also known as holistic thinking, can be explained by the three selection criteria of originality, user value, and producibility.

2.5 Hierarchy & idea selection

For selection decisions to be made, it is of great importance where to allocate the decision-making rights within the organization. For instance, decisions of higher-ups in an organization and in a centralized environment tend to have more consideration for the bigger picture in terms of organizational aims and the range of opportunities. On the contrary, when idea generation and selection decisions are made by the lower levels of the organization and in a decentralized environment, it draws on the deep and specialized knowledge of people who are most familiar with the relevant context (Kornish & Hutchison-Krupat, 2017).

In a study of Argyres and Silverman (2004) it is considered whether centralized or decentralized R&D decisions fits more in the creation of impactful innovation. They reach the conclusion that innovations of higher quality fit better into centralized R&D operations. The reason behind this is that a centralized R&D manager has greater control over the R&D activities of the entity as a whole and can also more accurately recognize and rate opportunities. On top of that, higher quality innovations usually require assistance of the higher-ups.

On the contrary, a research that supports to carry the selection decisions to a lower level within a company is Mihm et al. (2010). In this study they explore the advantages of making the lower-level units more specialized. It seems that specialized units accelerate the decision-making process, however, at the expense of the quality of the ideas. The primary cause for this is that specialized units are mainly looking in constricted areas. They prove that, regardless of whether the managers act holistically, the centralization of the department managers at the bottom management level produce identical results as when the CEO implements complete centralization.

Another study that investigates the benefits of the lower management level is Hutchison-Krupat & Kavadias (2015). They explore if resources contribute to the achievement of a project and, if they do contribute, how they contribute. While the researchers agree that better alignment is created with the company's goals when decisions come from the top management level, they state that the higher-ups are often failing to make correct decisions about resources, since they do not possess the required knowledge. The difficulty of the project seems to be of high importance when deciding on attributing a project to a higher- or lower management team. The key take-away is that the success of a more difficult

project increases when the decision about resources is allocated to the lower management team.

Selection is a crucial organizational resource that can be developed strategically and can be controlled through organizational planning. A behavioral pattern appears to be at play on the impact of hierarchy and its effect on the selection performance. By conducting a field study and a lab experiment, Keum & See (2017) investigate the role of hierarchy of authority in the innovation process. They reach the interesting conclusion that it is harmful to implement hierarchy to the idea generation stage of innovation, but they observe a favorable outcome when it is applied to the screening and selection stage of innovation.

2.6 Biases

One of the most popular biases in individuals is the degree by which someone ascribes success to their own actions and failure to external forces. For instance, in a horse race a person attributes a winning bet to his or her own ability to select the right horse, however, when this person faces a loss, he or she blames the horse for being too tired (Kornish & Hutchison-Krupat, 2017).

A similar effect regarding idea selection is stated by Siemsen (2008), since idea selection is a direct reflection of the reputation of an employee. He observes that lower skilled individuals are more tempted to choose a more complicated idea, because when it does not work out others can attribute the failure to the complexity of the idea, rather than the individual's incompetence. For a company to limit this disconnection between the interests of employee and themselves, they can introduce performance rewards (Katok & Siemsen, 2011).

One of the main conclusions drawn of their study (Rietzschel, Nijstad and Stroebe, 2010) is that when it comes to idea selection, individuals have a bias

against originality. The preference for feasibility and desirability are believed to be incompatible with originality. Also, people seem to have a high preference for ideas they believe that can be implemented and they seem to believe that this is contradictory with the selection of original ideas.

Blair & Mumford (2007) support this statement as they find that individuals rather choose understandable ideas that bring short-term benefits and are in accordance with the dominant social norms. This is all done while discarding high-risk, time consuming, and original ideas. Interestingly, original and risky ideas are more likely to be chosen in the presence of high time pressure and when selection criteria are looser.

This problem is also referred to as the creativity paradox by Mueller et al. (2012); people often reject creative ideas, in spite of the fact that creativity is declared as a desired objective. They reach the conclusion that despite of how broad-minded someone is, people undervalue a creative idea for the sake of minimizing uncertainty, since feeling uncertain in general is a negative association for humans.

Lucas & Nordgren (2021) arise with the theory of the creative cliff illusion, which they define as the false prediction that people expect their creativity to decline over time. They claim that creativity tends to increase or stay the same in an innovation session although individuals often presume that creativity decreases as time progresses. For instance, in one of the experiments comedians who believe more in their first idea to be the best idea stopped ideating earlier. With this, the researchers explain that individuals stop the creative process before they unleash their best idea if they assume their first idea is their best. Their theory implies that the effect occurs because of the wrong association individuals have about creativity (the novelty and usefulness of an idea) and idea production (the ability to generate an idea).

Reitzig & Sorenson (2013) analyze intern biases within firms referred to as intra-organizational provincialism. The concept explains the tendency of managers to select innovative ideas from their own sub-departments before other departments. The disproportional idea selection of manager comes at the cost of good ideas from other departments.

Baer & Brown (2012) conduct a research in which they chase the reason for why people accept change now and then, and other moments neglect them without hesitation. An unpredicted factor seems at play: psychological ownership, also known as the degree to which someone feels like an object is truly theirs. Feeling a strong psychological bond to an object can cause to stay open for others' suggestions to alter the object or to neglect any kind of feedback. In short, Baer and Brown find that people with a sense of ownership of an idea have a lower probability to accept change that diminishes their idea and a higher probability to approve suggestions that expanded them, relative to people with limited ownership.

With an experimental model, Hooshangi and Loewenstein (2018) investigate how generating ideas distort the business decisions of entrepreneurs. Moreover, they test if the possibility for other investors to see opportunity in a rejected idea interferes with the same business decisions. They show that individuals who generate ideas create biased evaluations of economic potential of ideas, regardless of the idea being their own idea or of someone else. Individuals appear to be overconfident of the value of their own idea and are highly committed to invest in it. However, when it comes to evaluating others' ideas individuals feel underconfident and have a lack of incentives to invest, even without competitive intentions.

Below in table 1, the studies mentioned earlier and their main findings on how to improve idea generation and idea selection are displayed. The table also

mentions all biases that are discussed. Hence, the answer to the first sub-question "which factors influence the innovation selection process?" can be found within this table. It appears that specific characteristics and tools, such as the risk matrix, the R-W-W screen, direct group communication and positive beliefs contribute to the issue of innovation selection. Furthermore, hybrid teams, teams with a wide range of skills, variety in the pool of ideas and emphasizing past individual achievements also create advantages for idea selection. On top of that, it is mentioned that the predictions of experts do not necessarily create more value than the freshmen and that holistic evaluating is more beneficial than purpose-driven thinking. Adding manipulations to an experiment such as defining an innovative idea by the criteria originality and feasibility also tend to improve the quality of the selected ideas. Then there are the findings on how applying a centralized operation system and handing over decision-making to the lower class improves idea selection performance.

Table 1:Main findings on idea generation, selection and biases

Authors	*Focus on idea generation, selection or biases*	*Key variables*	*Empirical strategy*	*Key findings*
Day (2007)	Idea selection	The risk matrix and the R-W-W ("real," "win," "worth it") screen	Providing tools to estimate the success of a project	The risk matrix shows an increase in risk as familiarity in products decreases. The R-W-W screen assists in reviewing the feasibility of a project
Dahan et al. (2011)	Idea selection	Prediction markets, direct group communication and information transparency	Securities-trading approach	Prediction markets and direct group communication improve decision-making more than individually-made predictions.
Yuan and Woodman (2010)	Idea generation + idea selection	Image outcome expectations and belief	Interactions between the contextual and individual factors within firms	The thinking of "outcome expectations" is a motivating force that drives innovative behavior
Rietzschel, Nijstad & Stroebe (2010)	Idea generation + idea selection	Feasible and desirable ideas at the cost of originality	Effectiveness and originality trade-off	The generation of creative ideas does not automatically imply the selection of creative ideas.
Girotra, Terwiesch & Ulrich (2010)	Idea generation + idea selection	Quality of the best idea	Individual -, team – and hybrid structure	Hybrid teams exceed teams that merely work together in the ability to discern the quality of the ideas.
Kavadias & Sommer (2009)	Idea generation	Group knowledge -and skills diversity	Homogenous – vs diverse groups	Diverse groups find better solutions relative to homogenous groups, however, this advantage diminishes as the scope of the problem increases
Erat (2017)	Idea generation	Dispersion	Pool structures	Dispersion affects the value derived from the top ideas positively
Goncalo & Duguid (2008)	Idea generation + idea selection	Group decision-making	Concentrating on personal attributions	Highlight past performances of individuals in groups to improve decisions
Nishikawa, Schreier & Ogawa (2013)	Idea generation	User-generated & designer-generated products	Comparing actual market performances	User-generated products outperform designer-generated products in market performance
Rietzschel, Nijstad & Stroebe (2010).	Idea selection	Intuitive vs. deliberative	Including manipulation in the idea selection approach	Higher idea selection performance when the criteria "originality" and "feasibility" are introduced than general instructions like selecting the "best ideas"

Wilson & Schooler (1991)	Idea selection	Holistic vs decomposed assessing	Assess an idea on a whole feeling versus on particular aspects	Holistically-made assessments produce better results than assessments based on purpose-driven thinking and decomposition
Argyres & Silverman (2004)	Idea selection	(De)centralization of R&D activities	Control over the R&D activities	Innovations of higher quality fit better into centralized R&D operations.
Mihm et al. (2010)	Idea selection	Centralization of lower-level units	Making the lower-level units more specialized	Lower-level units should make the selection decisions as they produce identical results as an complete centralization by the CEO.
Hutchison-Krupat & Kavadias (2015)	Idea selection	Decision-making	Decision-making by the lower management	Success of more difficult projects increases when decision-making is given to the lower management team.
Keum & See (2017)	Idea generation + idea selection	Hierarchy	Analyze behavioral patterns in hierarchy	Hierarchy in idea generation stage is harmful, but beneficial in the selection stage.
Kornish & Hutchison-Krupat (2017) + Siemsen (2008)	Bias	Bias against success and failure	Analyzing ideas of lower skilled individuals	Ascribing success to own actions and failure to external forces
Rietzschel, Nijstad & Stroebe (2010) + Blair & Mumford (2007) + Mueller et al. (2012)	Bias	Bias against originality/ creativity paradox	Investigating individuals on their preference for feasible vs original ideas	Feasibility and desirability are believed to be incompatible with originality
Lucas & Nordgren (2021)	Bias	Creative cliff illusion	Comedians who believe more in their first idea stopped ideating earlier	Creativity tends to increase or stay the same over time, but individuals presume that creativity decreases
Reitzig & Sorenson (2013)	Bias	Intra-organizational provincialism	Managers select innovative ideas out of sub-departments and other departments	Innovative ideas from own departments are selected before other departments' and is at the cost of their good ideas
Hooshangi and Loewenstein (2018)	Bias	Biased evaluations of economic potential of ideas and overconfidence	Test the possibility for other investors to see opportunity in a rejected idea	Individuals who generate ideas create biased evaluations of the economic potential of ideas and get overconfident in it

2.7 Conceptual Model & Hypotheses

This section is written based on the main assumption that involvement in idea generation can have two effects. The first is that you understand better what innovation is when you are involved in generation and, hence, there is improvement in the idea selection performance. The second assumption is that you become overconfident about the value of your own idea, which worsens the idea selection performance.

It is stated beforehand thar Rietzschel, Nijstad & Stroebe (2010) concluded that the generation of creative ideas does not automatically imply the selection of creative ideas. Also, thoroughly considering one's own idea prior to an idea selection decision has no significant effect on the performance. Contrary to the work of Rietzschel, Nijstad & Stroebe (2010), we expect to find a positive influence of the involvement in idea generation on the idea selection performance. The reason behind this is that we expect the individuals that generate ideas prior to the selection to have a deeper understanding about what criteria a novel product requires and, thus, to be able to identify high-quality ideas faster. The efforts that come forth in generating a novel idea helps in better visualizing the accuracy of the solution to the problem, since they dive deeper into the subject by trying to find a solution first. With this, the first hypothesis is stated:

H1: Involvement in idea generation influences the idea selection performance positively.

It is discussed before that Hooshangi & Loewenstein (2018) investigate how generating ideas distort the business decisions of entrepreneurs and that individuals who generate ideas create biased evaluations of economic value of ideas. Individuals appear to be overconfident in their own idea and are highly committed to invest in it. Besides the positive influence of the involvement in idea generation on the selection performance, we expect that involvement in idea

generation brings forth overconfidence, because of the sense of ownership that arises in people when generating an idea that is mentioned in Baer & Brown (2012). Thus, in this thesis we expect that exposure to feedback on generation performance of one's own idea brings forth overconfidence and influences the idea selection performance negatively, since rationally, idea generators can get fixated on the content of their own idea. This brings us to the next hypothesis:

H2: Being exposed to feedback on generation performance influences the idea selection performance negatively.

Then, since Yuan & Woodman (2010) support the thinking of "outcome expectations" being strong motivating forces that are driving innovative behavior, we believe that adopting an optimistic attitude towards one's own idea and believing in their achievement strengthens the relationship between the involvement in idea generation and the idea selection performance. The authors Yuan & Woodman (2010) discuss that Innovation is partly determined by performance and image outcome expectations, which is why we believe that positive thinking results in enhanced creativity and problem-solving skills by keeping out stress hormones to stay more focused. This increase in focus helps individuals to stay involved in the idea generation process even more, which is why it is assumed that the relationship between the involvement in idea generation and the idea selection performance is reinforced.

When it comes to competitiveness of individuals, we believe that being competitive in general arises the urge to be involved in a particular issue. For this reason, competitive individuals are more passionate in doing what they are told and want to perform better than others. The study of Brown et al. (1998) discusses that salespeople who are high in trait competitiveness set higher goals and indicates that a self-set goal level is related strongly to performance. For this reason, we believe that not only being more focused leads to wanting to be more

involved in something, like in the case of adopting a positive attitude, but we also believe that being more involved in something increases one's focus. In other words, actions can create feelings and feelings can create actions. Regarding this, it is expected that being competitive also strengthens the relationship between the involvement in idea generation and the idea selection performance. Therefore, the third and fourth hypotheses are stated as follows:

H3: Adopting an optimistic attitude strengthens the association between involvement in idea generation and the idea selection performance.

H4: Being competitive strengthens the association between involvement in idea generation and the idea selection performance.

It is also assumed that adopting an optimistic attitude and competitiveness strengthen the relationship between being exposed to feedback on generation performance and the idea selection performance. Prior literature state that it is likely for idea generating individuals to overvalue the success of their own ideas (Dane, 2010) and overconfidence is a major cause of the errors that occur when forecasting the value of one's own ideas (Fuchs et al., 2019). As a result, we believe that being positive causes people to evaluate the value of their ideas even higher when exposed to feedback on generation performance. Being positive about one's own idea and being competitive may be useful to be more involved in idea generation and, in turn, select better ideas. However, in the case of optimism, it may also lead in being more optimistic about one's idea and get more overconfident than one would already be. This, of course, is believed to affect the idea selection performance negatively.

In the case of competitiveness, being competitive can produce feelings of extreme adoption towards one's own idea when exposed to feedback on generation performance, which may be the cause in failing to see the value of other's ideas. Again, through overconfidence in one's own idea, the urge to

perform the best would be multiplied, because people cannot bare the idea that others are performing better relatively to them. With this, the fifth and sixth hypotheses are mentioned:

H5: Adopting an optimistic attitude strengthens the association between exposure to feedback on generation performance and the idea selection performance.

H6: Being competitive strengthens the association between exposure to feedback on generation performance and the idea selection performance.

All the stated hypotheses and their described effects are displayed in the conceptual model in figure 1. The scales about the adoption of an optimistic attitude and being competitive are obtained from Nenkov, Inman & Hulland (2008) and Plouffe, Sridharan & Barclay (2010).

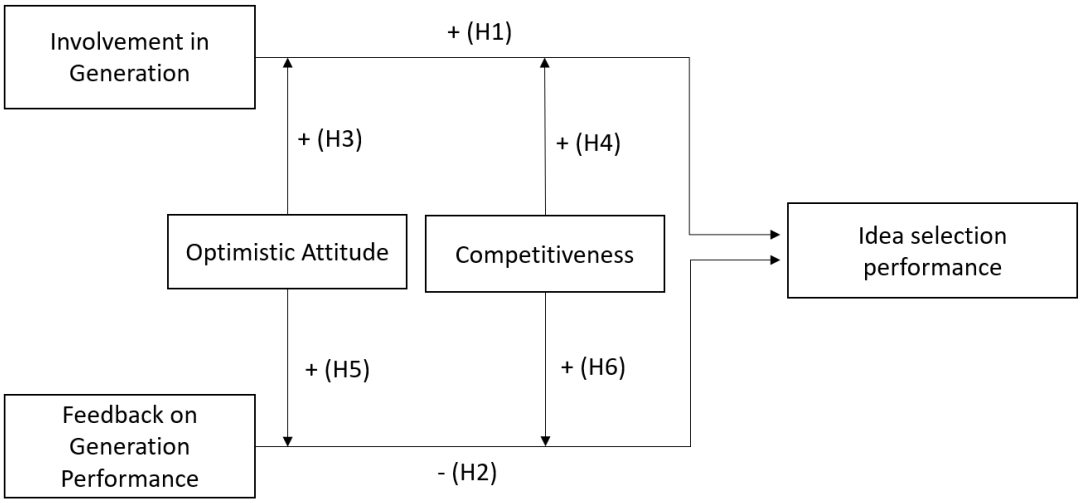


Figure 1: Conceptual Model

3. Research Methodology

3.1 Research Design

The experiment conducted in this research takes the form of an online laboratory experiment. In order to retrieve information about the aforementioned hypotheses an experimental survey is performed in Qualtrics (see table 18 in the appendix for the survey). The experiment uses a between-subject design in order to discover the effects of being involved in generating ideas and being exposed to generation performance information on the idea selection performance.

3.2 Participants

To conduct this experiment and to retrieve the effect of every single variable separately, participants are randomly distributed amongst one of the three groups. The first group is the control group that solely evaluates others' ideas. The second group is involved in both the idea generation and the idea selection. The third group then contains participants that also generate and select ideas, but with an extra manipulation to check for their change in behavior when being exposed to feedback about their idea generation performance. From now on, the first group is referred to as the control group, the second group as the non-exposed group and the third group as the exposed group. Kornish & Ulrich (2014) state that they consistently find predictive power in a sample as small as twenty consumers. To ensure that the sample size is reliable enough each group that is to be investigated consists of at least 50 participants. The participants are mostly composed of students of the Erasmus University, but also students of other universities. Besides of the currently studying participants, the experiment also reaches out to employees in the lower organizational levels. It is asked in the experiment whether employees are working in a lower-class or higher-class level.

3.3 Method

The experiment is conducted in three parts; the first part includes generating and evaluating your own idea as well as sharing personal information. The control group does not participate in the idea generation and only shares their personal information. Part two is only relevant for the manipulation group and, thus, includes the manipulation. The manipulation exists of an interruption between the idea generation and – selection parts in which a screen with a fake statement is projected that shows the own idea is rated as a high-quality idea by a software that recognizes high-quality innovation. The software is described as one that is developed by an external company that is willing to help us in our study to contribute to our understanding of the idea selection process. It is to be verified if participants change their behavior when they get to hear that they performed above average. The participants are not aware that the statement is false, because of the time lapse between the interruption and idea generation. It is announced in the first part of the experiment that the own idea is going to be evaluated and, as soon as the idea is rated, the grade is going to be projected on the screen. In the meantime, the participants are asked to keep answering the following questions. Hence, the time lapse between part 1 and 2 makes it look like the idea is rated by the software.

Then, part three consists of the idea selection and evaluation process. All three groups are selecting and rating the same 10 ideas (see table 19 in appendix). Thus, the evaluation of the 10 ideas happens after the generating phase for the non-exposure – and exposure group. Moreover, regarding the adopted manipulation in part 2, while giving false statements to participants might be frowned upon, such statements are innocuous and are likely not to cause any harm to participants. Deceiving participants in experiments is justified by Bonetti (1998) who states that there are potential gains of using manipulation. This study

discusses the use of deception in experimental economics. One argument in favor of using deception is that it is necessary to achieve some experimental objectives. The most important benefit of deception is then the way in which the attention of the participants can be effectively distracted, guaranteeing that the measured behavior is more natural and spontaneous. The study concludes that deception does not jeopardize future experiments or subject behavior. Thus, prior research does not recommend against the use of innocuous, yet fake, statements.

3.4 Problem

The problem that is to be solved in the first part of the experiment, idea generation, consists of the topic consumer goods within a household which speaks to the majority of people. The underlying reason why consumer goods are chosen is that participants then are able to easily recognize themselves in a problem and find an appropriate solution. The participants are explicitly asked to generate one innovative product that eases their life at home. The first introduction of the washing machine and the thermos that keeps your drinks warm are given as example to help them on the right track. They could think for instance of specific rooms like the kitchen, bathroom, living room, bedroom or garden. They are asked to explain their idea within 100 words and there is no time limit on how long they can take. We also offer the option for them to upload an image that represents their idea to make it easier for them to pass on the depths of their idea.

Again, for part three of the experiment, otherwise idea selection, ten consumer good products that can be used at home are to be selected and evaluated. The products that are chosen for the experiment include randomly chosen equipment with different functions for at home. They may be entirely different in usage and function, but they all have in common that they solve a specific problem at home. These products are picked, since they are innovative to

different degrees and are all products that are purchasable and, thus, familiar to some degree with the participants. The participants are asked to grade the products on their innovativeness without any further explanation on the definition of innovativeness. Like stated before, Wilson and Schooler (1991) mention that assessments that are made holistically produce better results than assessments based on purpose-driven thinking and decomposition. This is important to point out, since the experiment in this research is based on this statement and participants are asked to evaluate and select an idea holistically.

3.5 Procedure

To have a baseline to rate the evaluations of participants on the ten ideas on, two professionals are asked for help. This study follows the research methods of Kornish & Ulrich (2014) who also compare their data output with the expert ratings. Also, Girotra et al. (2010) conclude that the best ways to estimate idea quality are with holistic ratings of business value by trained experts. The first assessor is an entrepreneur with years of experience in different fields such as consumer electronics, (digital) currencies, sales, engineering and the gaming industry. The second assessor is someone that is theoretically educated and specialized in marketing and innovation. Their evaluations on the ten ideas serve as the reference-point for the choice of the participants. These two assessors are chosen explicitly, because the viewpoints of someone with actual experience and someone with the theoretical knowledge in the field of innovation and marketing are expected to be of huge importance, but they might have fundamental differences. In short, it is decided to compare the results of the participants based on two perspectives. We believe that solely assessing the answers on one of the baselines brings biased results, which is the reason for adding an extra viewpoint. From now on, the first assessor is referred to as the entrepreneur and the second assessor as the specialist.

The data is obtained from Qualtrics and analyzed using the SPSS program. Since all three groups attend in the different parts of the experiment, three various surveys are set-up to allocate each group to their associated questions. Table 18 in the appendix shows which groups take part in which questions in the survey by the colored boxes before the question. For clarification purposes, CG stands for Control-Group, NEG for Non-Exposed-Group and EG for Exposed-Group. The results of the ideation process are obtained by performing regression analyses and statistical tests. The experiment controls for four variables in how they influence the outcome. These variables are gender, age, educational level and employment status. The survey gives participants the possibility to receive the outcomes on the experiment in change for their e-mail address. This is added as an extra incentive to make sure participants finish the survey.

3.6 Pre-test

In order to construct a representative and reliable experiment, a pre-test is performed to identify potential deficiencies within the research design. In the pre-test phase, a group of five individuals are asked to complete the survey that is meant for the exposure group. The reason behind this is to make sure they come across every possible question as the other two surveys are a shortened version of the survey for the exposure group. One of the first things that is measured is the required time for a survey completion. On average the respondents take ten minutes to finish the survey. After this, the individuals are asked about their opinions on the idea generation and – selection tasks. “Are the tasks clarified clearly?”, “Are the functions and features of the ten products well described?” and “How do you feel about the length of the survey?” are examples of questions that are asked. Overall, they agreed with the survey set-up and its procedure. Previously, the survey was expected to be a little too lengthy, so consideration was given to reducing the number of the ten ideas. Furthermore, it was thought that

participants could have some trouble in understanding how the ten ideas worked solely by reading the product descriptions. However, it seems the descriptions and pictures are enough to figure out the essence of the products. On top of that, they stated the length of the survey to be definitely manageable, so it is decided to keep all ten products. Also, the instructions in the idea generation task are perceived as understandable.

Despite all the positive feedback that is received, the participants were able to spot some points to improve the survey even more. Some of their advice is related to minor grammar errors and others to the manipulation in the second part of the survey. The wording regarding the own idea that is said to be rated is found to be nicely set out. Thus, they perceived the manipulation as real until they were told it is a fake statement. Then, they have given three recommendations to improve the credibility even more. The first is to lower the exposed grade in the manipulation from a nine to an eight, since they think that a nine might be perceived as too high, by which some participants can lose their trust. Secondly, the external company that is claimed to be part of the experiment is given a name to increase the credibility. The name is stated to be “Intelligent Connection”. Lastly, an extra page is added before the revealing of the grade of the own product so participants can be prepared to receive their grade and to increase the time-gap. This page includes a check mark and text that states their results are progressed and will be shown in a few seconds. The recommendations of the participants are all taken into consideration and the survey is re-adjusted based on this.

3.7 Variables and their measurements

A set of different variables is used in measuring the effect on the idea selection score by the entrepreneur and the specialist. The regression models in this study can be composed of 3 independent variables, 4 moderation effects, 4 control variables and 1 dependent variable. The descriptive statistics are presented in table 21 in the appendix. The variables with according descriptions can be find below.

Idea Selection Score (ISS): this is a continuous dependent variable which can range from 0 to 10 and refers to the average quality of the selected three ideas by each respondent. This study follows Keum & See (2017) in defining the dependent variable for selection. The quality measure for each of the three ideas is defined as the value for the corresponding idea that the experts give them. For example, if a participant chooses Botanium as their best idea, then it takes the value the experts gave the Botanium. The option to choose one's own idea is not included in the measurement of the average quality, so if respondents select their own idea the average quality of the remaining top two ideas is calculated. The rationale for this is that the own ideas are not individually evaluated by the experts and thus have an unknown rating. To not under- or overvalue the ideas, it is decided to leave them out. The ISS is measured by the ratings of the entrepreneur as well as the specialist. Therefore, the idea selection score for the entrepreneur is portrayed as ISSENT and for the specialist as ISSSPE. A higher ISS, for this reason, indicates to a higher idea selection performance for both the entrepreneur ratings as the specialist ratings.

Control: is an independent binary variable that take the value 1 for those who belong to the control group and 0 otherwise.

INV: is an independent binary variable that indicates whether someone belonged to the NEG and is involved in idea generation without being exposed to feedback on generation performance. It takes the value 1 if this is true and 0 otherwise.

EXP: which is an abbreviation of exposure that refers to the exposure of "feedback on generation performance". This independent variable is also a binary variable that can take the value 1 for those who are exposed and 0 for those who are not.

OPT: is measured as a continuous moderation variable and refers to whether participants adopt an optimistic attitude or not. The variable is measured together with the independent variables "INV" and "Exp". The questions regarding optimistic attitude in the survey are measured in Likert scales and are translated into numerical variables that can take the value 1 up to 5 for respectively the scales "Totally disagree" up to "Totally agree"". Three questions regarding optimism are asked and thus the average of these values is taken.

COMP: a continuous variable that refers to the competitiveness of participants. The variable can take the values 1 up to 5, like for the optimism. The same that goes for the optimism also goes for competitiveness when it comes to being measured as moderation variables with "INV" and "Exp". Five questions regarding competitiveness are asked and thus the average of these values is taken.

Male: is a binary control variable that takes the value 1 for males and 0 for females.

Education: is a categorical control variable that takes the values 1 up to 5 for respectively, "Elementary school, High-school, Secondary education (MBO), Higher education (HBO/ WO Bachelor/ WO Master) and Doctorate"

Age: is a continuous control variable that takes any value

Employment: is a categorical control variable that takes the value 1 for the lower-levels and 0 for the unemployed

3.8 Model Equation

Multiple linear regressions are executed in this study to retrieve if significant effects exist between the independent variables and the dependent variable. On top of that, the predictability of the independent variables on the dependent variable are presented in the form of the R-squared. In total, six regression models are conducted. The first one consists of the effects of only the independent variables "INV" and "Exp" on the dependent variable and the second of only "Control" and "Exp" on the dependent variable. Then, the third model adds the moderation variables to the first model and so does the fourth model for model two. Model five and six control for the same models with the moderation effects to test whether one affects the relationship between another independent variable and the dependent variable and add the four control variables to respectively model three and four.

The formulas for the six models are displayed below. The variables β3 through β6 describe the moderation effects. In short, significant moderation effects, mean that e.g., the effect of involvement on idea generation on the ISS depends on adopting an optimistic attitude and vice versa. Thus, involvement in idea generation can affect the relationship between the dependent and

independent variables, when the moderation is significant. This means that moderation has occurred. The following regression models are performed, assuming α = 0.05:

Model 1: $$ISS = \beta 0 + \beta 1\, INV + \beta 2\, Exp + \varepsilon$$

Model 2: $$ISS = \beta 0 + \beta 1\, Control + \beta 2\, Exp + \varepsilon$$

Model 3: $$ISS = \beta 0 + \beta 1\, INV + \beta 2\, Exp + \beta 3\, INV * OPT + \beta 4\, INV * COMP + \beta 5\, Exp * OPT + \beta 6\, Exp * COMP + \varepsilon$$

Model 4: $$ISS = \beta 0 + \beta 1\, Control + \beta 2\, Exp + \beta 3\, INV * OPT + \beta 4\, INV * COMP + \beta 5\, Exp * OPT + \beta 6\, Exp * COMP + \varepsilon$$

Model 5: $$ISS = \beta 0 + \beta 1\, INV + \beta 2\, Exp + \beta 3\, INV * OPT + \beta 4\, INV * COMP + \beta 5\, Exp * OPT + \beta 6\, Exp * COMP + \beta 7\, Male + \beta 8\, Education + \beta 9\, Age + \beta 10\, Employment + \varepsilon$$

Model 6: $$ISS = \beta 0 + \beta 1\, Control + \beta 2\, Exp + \beta 3\, INV * OPT + \beta 4\, INV * COMP + \beta 5\, Exp * OPT + \beta 6\, Exp * COMP + \beta 7\, Male + \beta 8\, Education + \beta 9\, Age + \beta 10\, Employment + \varepsilon$$

4. Data Analysis and Results

After controlling for 18 incomplete answers and removing 47 participants that selected to be in the middle – or higher level in the hierarchy of their firm, the data set of 218 responses is composed of 153 responses. Then, with the extraction of 2 outliers, the final dataset is left with 151 respondents.

4.1 Assumptions of linear regression

Prior to the conduction of the analyses, the data is checked and tested against the assumptions of linear regression to indicate to what degree the regression methods fit the underlying data. Figures that are related to these assumptions are reported in the appendix.

1. Sufficient degrees of freedom

The degrees of freedom are the numbers of values in the data that can differ freely when estimating statistical parameters. The rule of thumb regarding the minimum number of degrees of freedom would be fivefold the number of parameters involved in the model. The regression model in this study consists of 11 parameters, 151 observations and 150 degrees of freedom, which implies that the requirement for enough degrees of freedom is met.

2. Homoscedasticity

The necessity for homoscedasticity is to have non-biased and consistent standard errors of the estimates to perform thorough testing of hypotheses. In figure 6 of the appendix a scatterplot is shown that tests for homoscedasticity with on the y-axis the regression standardized residual and on the x-axis the regression standardized predicted value. The assumption for homoscedasticity is met, since the data points across the groups follow the same line and are not standing away from each other too much.

3. Test of Normality

To check for the assumption of normality, two test as well as histograms are used. The data is normally distributed for both the ISS for the entrepreneur ratings and ISS for the specialist ratings. The reason for this is that the significance rates for the Shapiro-Wilk test is 0.061 for the entrepreneur ratings and 0.052 for the specialist ratings, which are greater than the alpha of 0.05 (table 22 in the appendix). Thus, the null-hypothesis that states that the dependent variable is normally distributed is not rejected. So, both dependent variables are normally distributed. The normal distribution of the dependent variables can also be seen in the histogram in figure 7 in the appendix. The figure shows that the residuals are normally distributed for both the ISSENT and ISSSPE with a peak in the middle of the distribution.

4) Linear relationship between the dependent and independent variables

To test for this assumption a regression with the expected - and observed cumulative probabilities are plotted in figure 8 in the appendix. These points are more or less following the trendline, so this assumption is not violated.

5) Avoidance of multicollinearity

Multicollinearity is the occurrence of high intercorrelations among independent variables in a multiple regression model. To avoid this situation, the correlation between independent variables should be less than 0.7. This is the case for the variables in this model as can be seen in table 23 in the appendix. The values between the independent variables are less than 0.7 which rejects multicollinearity, implying that the statistical significance of the independent variables is not negated. Table 24 indicates to the variance inflation factors (VIF) that measures the amount of multicollinearity of variables in a multiple regression. If the VIF value exceeding 4.0 then there is a problem with multicollinearity, which is not the case for the variables in this study.

4.2 Output of the linear regressions

4.2.1 Model 1 & 2 Output

Starting with the first model, the effects of the independent variables “INV” and “Exp” compared to the “Control” are measured on the dependent variable “idea selection score” for the entrepreneur and the specialist. The results of the output for model 1 and 2 are shown in table 2. It can be drawn that for the entrepreneur ratings “INV” has a positive effect compared to the “Control” on the ISS, whereas “Exp” has a negative effect compared to the “Control”, since the coefficients are respectively 0.332 and -0.026. This proves the expected effect for h1 for the NEG as a higher ISS is indicating to a higher idea selection performance. The effect of “Exp” compared to the CG can be due to the involvement on idea generation, exposure or both. This means that being in the NEG increases the ISS with 0.332 points compared to the CG, ceteris paribus. However, the p-values for respectively “INV” and “Exp” are 0.045 and 0.892 and are telling that only “INV” influences the dependent variable significantly since it does not exceed the alpha of 0.05. Seemingly, being in the EG compared to the CG does not affect the ISSENT significantly.

The effect of exposure to feedback on generation performance on the ISS, otherwise the answer on h2, can be derived from model 2. The key here is to look at the coefficients for the variable “Exp” as it is relative to the “INV”. The coefficient is -0.359 and, hence, negative as expected. This means that being exposed to feedback on generation performance decreases the ISS with 0.359 points compared to the INV, ceteris paribus. The p-value is 0.062 and smaller than the 5% significance level. This means that “Exp” has an insignificant effect on the ISSENT compared to the “INV”. When assuming an alpha of 0.1, however, a significant effect exists of being exposed on the dependent variable compared to the “INV”. The R-squared is found to be 0.061 for both models, which means that 6.1% of the variation in the dependent variable is explained by the independent variables. This

is a low value implying that the independent variables are not explaining much in the variation of the dependent variable.

From this table it also can be deduced that for model 1 both “INV” and “Exp” have a positive effect on the ISSSPE, since the coefficients of respectively 0.221 and 0.258 are positive. This confirms the hypothesis of “INV” having a positive effect compared to the CG on the idea selection performance. For the variable “Exp” relatively to the CG, it can be stated that the positive effect is due to the involvement in idea generation, the exposure or both. However, the p-value of 0.106 for “INV” exceeds the alpha of 0.05, which implies that the variable does not affect the dependent variable significantly. The p-value for exposure is 0.049 and hence lower than the alpha, which is why it can be said that the variable affects the ISSSPE significantly. This means that being in the EG increases the ISS with 0.258 points compared to the CG, ceteris paribus.

The coefficient for “Exp” in model 2 is 0.037 and positive. This is the opposite expectation for h2, but its p-value of 0.788 exceeds the significance level of 5%. Therefore, it can be concluded that compared to the “INV”, there is no significant effect of the “Exp” on the ISSSPE. The R-squared for the ISSSPE in both model 1 and 2 is 0.056, which means that 5.6% of the variation in the dependent variable is explained by the independent variables. Therefore, the independent variables are again not explaining much in the variation of the dependent variable.

In short, where hypothesis 1 holds in model 1 for the ISSENT for the “INV” compared to the CG, it holds for the “Exp” compared to the CG for the ISSSPE. Conversely, hypothesis 2 is rejected for both the ISSENT and ISSSPE in model 2.

4.2.2 Model 3 & 4 Output

In addition to the first two models, the third and fourth model test for the moderation effects. These moderation effects are the combined effects of INV*OPT, INV*COMP, Exp*OPT and Exp*COMP and are displayed in table 3.

First of all, for model 3 for the ISSENT, results show a positive effect of "INV" compared to the CG, but a negative effect for "Exp" compared to the CG, with a coefficient of respectively 0.732 and -0.395. This time, both variables are insignificant (p-values are higher than 0.05). It can be concluded that the "INV" and "Exp" have no significant influence on the ISSENT.

Second, model 4 again reveals a negative, but insignificant effect of the "Exp". The p-value is 0.341 and bigger than the 5% significance level. Yet again, the "Exp" has no significant effect on the ISSENT compared to the "INV".

Third, for model 3 and 4, it can be observed that the moderation effects INV*OPT and Exp*COMP have a negative effect and INV*COMP and Exp*OPT have a positive effect with respectively the coefficients of -0.295, -0.055, 0.223 and 0.158. The positive effect for INV*COMP is expected, since this indicates to a higher idea selection performance (h4), but the negative effect of INV*OPT is surprising which seems to violate h3. The negative effect of Exp*COMP on the ISS is also anticipated to deteriorate the idea selection performance (h6), but the positive effect of Exp*OPT is unexpected (h5). On top of that, the only significant effect for the four moderation effects exists for the variable INV*OPT, which has a p-value of 0.044 ($\alpha<0.05$). Hereby it is interesting to mention that in the first model a significant effect exists for "INV" on the ISS compared to the CG, but when accounting for the moderation of "INV" and "OPT" on the ISS, the significant effect seems to vanish. This means that "INV" on its own does affect the ISS up until it is combined with the effect of being optimistic. All other moderation variables have a p-value higher than the significance level of 5%, implying that INV*COMP, Exp*OPT and Exp*COMP have no significant effect on the ISSENT. The significant effect of INV*OPT means that if "INV" is equal to 1 and OPT is not zero (which is logical to hold), then the constant of 5.834 decreases with 0.295 points relatively to the CG, ceteris paribus. The same is true for both model 3 and 4 except for the

change in the constant. The corresponding constant for model 4 of the ISSENT is 6.566. This means that there is a significant negative effect of being optimistic on idea selection performance through “INV”.

Then once again, model 3 for the ISSSPE depicts the same image with slightly different values as the interpretations for the effects of “INV” and “Exp” compared to the CG are the same. Concluding that both variables are insignificant (p-values are higher than 0.05), the “INV” and “Exp” have no significant effect on the ISSSPE.

Furthermore, model 4 also illustrates a negative, but insignificant effect of the “Exp” for the ISSSPE. With a p-value of 0.260 it can be stated that the “Exp” has no significant effect on the ISSENT compared to the “INV”.

Moreover, the moderation effects for the ISSSPE can be interpreted the same way as is done for the ISSENT. The coefficients are rather different to some extent, but the signs and the significance of the variables are all the same, except for one. For example, INV*OPT has a coefficient of -0.225 and a p-value of 0.039 (which is significant as it is smaller than the 5% significance level). Yet again, this is the only significant moderation effect. Also, the variable has a negative effect on the ISSSPE that represents that being optimistic decreases the idea selection performance through “INV”. Like for the ISSENT this is the case for both model 3 and 4. The only moderation variable that is different is the Exp*COMP with an unexpected positive effect. However, the significance can be interpreted like for the ISSENT as the p-value is higher than 0.05.

Lastly, regarding the R-squared, the coefficients for model 3 and 4 is 0.096 for the ISSENT and 0.086 for the ISSSPE. Respectively this means that 9.6% versus 8.6% of the variation in the dependent variable is explained by the independent variables. These are higher than the R-squared for model 1 and 2, thus the new models have more explaining power.

Summarized, in all cases h1 and h2 are rejected, as there is no effect at all on the ISS. Then, the results of model 3 and 4 for both ISSENT and ISSSPE suggest that h3, h4, h5 and h6 are rejected. The rejection of h3 is because INV*OPT seems not to have a positive, but a negative effect on the idea selection performance and h4 up to h6 are rejected as there is no effect at all for INV*COMP, Exp*OPT and Exp*COMP.

4.2.3 Model 5 & 6 Output

Lastly, model 5 and 6 are an extension of the third and fourth model as they also contain control variables. The results are presented in table 4. As goes for the third model, the variable “INV” has a positive effect and “Exp” a negative effect in model 5. This is true for both the ISSENT (beta1= 1.029, beta2= -0.369) and ISSSPE (beta1= 0.693, beta2= -0.158). In both cases, both of the variables do not influence the dependent variable significantly ($p > .05$). Hence, there is no significant effect of “INV” on the ISS compared to the CG.

For model 6 for the entrepreneur- and specialist ratings, the coefficients are again negative with respectively the values -1.398 and -0.851. However, the p-values are respectively 0.242 and 0.318, which are higher than the 5% significance level. Yet again, there is no significant effect of “Exp” relatively to “INV” on the idea selection performance.

The moderation variables in model 5 and 6 that have a negative effect are again INV*OPT and Exp*COMP for the ISSENT and only INV*OPT for the ISSSPE. All other moderator variables are positive. For the entrepreneur ratings, again, only INV*OPT is significantly affecting the ISS as the p-value is 0.039, which is smaller than the 5% significance level. The significant effect is implying that if “INV” is equal to 1 and OPT is not zero (which is logical to hold), then the constant of 5.621 decreases with 0.303 points relatively to the CG, ceteris paribus. The same is true for both model 5 and 6 except for the change in the constant. The

corresponding constant for model 6 of the ISSENT is 6.650. This means that there is a significant negative effect of being optimistic on idea selection performance through "INV". Regarding the moderator effects for the specialist ratings, no significant effect exists for any of the variables on a significance level of 5%. However, when assuming an alpha of 10%, INV*OPT is again significantly affecting the ISSSPE. Only then, it can be said that if "INV" is equal to 1 and OPT is not zero, then the constant of 7.144 decreases with 0.186 points relatively to the CG for model 5, ceteris paribus. The same holds for model 6 except for the change in the constant. The corresponding constant for model 6 of the ISSSPE is 7.837. It indicates that there is a significant negative effect of being optimistic on idea selection performance through "INV".

Next on to be discussed are the control variables in model 5 and 6. It can be drawn from the table that for the ISSENT the variables "male" and "employment" affect the ISS negatively and "education" and "age" positively, with respectively the coefficients -0.349, -0.079, 0.037 and 0.013. The only significant factor, however, is "male" with a p-value of 0.036. Education, age and employment seem to have nothing to do with the ISS and are not significantly affecting it ($p > .05$). For the variable "male" this indicates that being male allows the constant of the ISS to decrease with 0.349 points, ceteris paribus. For model 5 the constant would be 5.621 and for model 6 it is 6.650. In other words, being male seems to decrease the idea selection performance, otherwise it can be said that females perform better in their idea selection performance. The R-squared is found to be 0.134, which means that 13.4% of the variation in the dependent variable is explained by the independent variables.

The control variables for the ISSSPE in model 5 and 6 with a negative effect are "male", "education" and "age". Only "employment" illustrates a positive effect. The coefficients are respectively -0.107, -0.042, -0.007 and 0.228. On a 5%

significance level none of the control variables is significantly influencing the ISSSPE ($p>0.05$). Only at an alpha level of 10% it can be assumed that employment ($p=0.060$) affects the ISS significantly. This can be interpreted as an increase in the constant for the ISSSPE if one is working as a lower-level rather than someone unemployed. The constant for model 5 is 7.144 and 7.837 for model 6. It can also be said that lower-levels perform better in the idea selection performance than the unemployed. The R-squared in model 5 and 6 is higher than for model 1 up to 4 with a value of 0.113. So, now 11.3% of the variation in the dependent variable is explained by the independent variables. Since model 5 and 6 display the best model fit (13.4% and 11.3%), this study focuses on the fifth and sixth regression model that includes the independent variables, moderation variables and control variables.

Based on the previous statements, it is concluded that all of the hypotheses are rejected as h3 states that INV*OPT influences the idea selection performance positively, but in reality, a negative influence is found for the ISSENT and no effect for the ISSSPE. When it comes to h1, h2, h4, h5 and h6, the reason for rejection of these hypotheses is that there is no significant effect to be found at all. Lastly, the only control variable that affects the idea selection performance significantly on a negative level is “male” for the ISSENT. All the previous results also hold for the ISSAVG.[1]

[1] The six models are also analyzed for the dependent variable “ISSAVG”, which is the average ISS rating of participants based on their ratings by the two experts. The results that hold for ISSENT and ISSSPE are robust with ISSAVG.

Table 2: Regression results for several models (N=151)

	Model 1			Model 2			Model 1			Model 2		
DV	**ISSENT**						**ISSSPE**					
Variable	**B**	**SE**	**P**	**B**	**SE**	**P**	**B**	**SE**	**P**	**B**	**SE**	**P**
Constant	5.834	.137	<.001***	6.167	.133	<.001***	6.942	.098	<.001***	7.164	.095	<.001***
Control				-.332	.191	.045**				-.221	.136	.106
INV	.332	.191	.045**				.221	.136	.106			
Exp	-.026	.193	.892	-.359	.190	.062*	.258	.137	.049**	.037	.135	.788
R-squared	.061			.061			.056			.056		

Dependent variable: ISSENT & ISSSPE
*** Significant at the 0.01 level
** Significant at the 0.05 level
* Significant at the 0.1 level

Table 3: Regression results for several models (N=151)

	Model 3			Model 4			Model 3			Model 4		
DV	**ISSENT**						**ISSSPE**					
Variable	**B**	**SE**	**P**	**B**	**SE**	**P**	**B**	**SE**	**P**	**B**	**SE**	**P**
Constant	5.834	.137	<.001***	6.566	.813	<.001***	6.942	.098	<.001***	7.689	.579	<.001***
Control				-.732	.825	.376				-.746	.587	.206
INV	.732	.825	.376				.746	.587	.206			
Exp	-.395	.865	.648	-1.127	1.179	.341	-.202	.616	.743	-.948	.839	.260
INV*OPT	-.295	.170	.044**	-.295	.170	.044**	-.225	.121	.039**	-.225	.121	.039**
INV*COMP	.223	.185	.231	.223	.185	.231	.101	.132	.445	.101	.132	.445
Exp*OPT	.158	.173	.363	.158	.173	.363	.045	.123	.716	.045	.123	.716
Exp*COMP	-.055	.159	.729	-.055	.159	.729	.090	.113	.426	.090	.113	.426
R-squared	.096			.096			.086			.086		

Dependent variable: ISSENT & ISSSPE
*** Significant at the 0.01 level
** Significant at the 0.05 level
* Significant at the 0.1 level

Table 4: Regression results for several models (N=151)

	Model 5			Model 6			Model 5			Model 6		
DV	**ISSENT**						**ISSSPE**					
Variable	**B**	**SE**	**P**	**B**	**SE**	**P**	**B**	**SE**	**P**	**B**	**SE**	**P**
Constant	5.621	.568	<.001***	6.650	1.010	<.001***	7.144	.406	<.001***	7.837	.721	<.001***
Control				-1.029	.839	.222				-.693	.599	.249
INV	1.029	.839	.222				.693	.599	.249			
Exp	-.369	.866	.670	-1.398	1.190	.242	-.158	.618	.799	-.851	.849	.318
INV*OPT	-.303	.171	.039**	-.303	.171	.039**	-.186	.122	.074*	-.186	.122	.074*
INV*COMP	.135	.189	.476	.135	.189	.476	.095	.135	.484	.095	.135	.484
Exp*OPT	.158	.174	.366	.158	.174	.366	.033	.124	.790	.033	.124	.790
Exp*COMP	-.069	.159	.664	-.069	.159	.664	.092	.113	.420	.092	.113	.420
Male	-.349	.165	.036**	-.349	.165	.036**	-.107	.117	.363	-.107	.117	.363
Education	.037	.116	.748	.037	.116	.748	-.042	.083	.612	-.042	.083	.612
Age	.013	.019	.473	.013	.019	.473	-.007	.013	.593	-.007	.013	.593
Employment	-.079	.168	.642	-.079	.168	.642	.228	.120	.060*	.228	.120	.060*
R-squared	**.134**			**.134**			**.113**			**.113**		

Dependent variable: ISSENT & ISSSPE

*** Significant at the 0.01 level

** Significant at the 0.05 level

* Significant at the 0.1 level

4.3 Top 3 Idea Selections

This section elaborates on the ability of participants to select the best ideas out of the ten ideas. The top 3 selected ideas of the entrepreneur and the specialist are taken as a reference point for the best ideas (see table 5).

Table 5: Top 3 ideas of the experts

Top 3 ideas	Entrepreneur	Specialist
#1	Lua-pot	Stixfresh
#2	The plate	Botanium
#3	The drain weasel	Water purifier bottle

The results can be drawn from table 6 and 7. As for table 6, it shows the percentage of participants across the groups that selected the same idea at the same rank as the experts. It can be seen that for all three groups and all three ranks (except for the third rank in the NEG) a higher number of participants have chosen the selected ideas of the specialist relatively to the ideas of the entrepreneur. Especially the EG seems to perform good with the specialist rankings as ideas of all three ranks are almost chosen for 50%.

The results of table 7 may seem similar but this table indicates whether participants chose the same ideas as the experts and how many, so the rank does not matter in this case. Specifically, it presents the percentage of participants across the groups that selected a number of identical answers and the percentage that chose their own idea. Once again, the numbers state that the participants are more on one line with the selection of the specialist as the percentages for 0 identical answers for the specialist selections are lower compared to those of the entrepreneur. It is also interesting to notice that in the EG group an additional 7% of participants choose more often their own idea compared to the NEG. The reason for this may be the manipulation that states that their generated idea is evaluated with an 8, which made them more confident in their own idea.

Table 6: % of participants for the different groups that selected the same idea per rank of ideas.

	ENTREPRENEUR SELECTIONS			SPECIALIST SELECTIONS		
TOP 3 IDEAS	**#1**	**#2**	**#3**	**#1**	**#2**	**#3**
CG	29%	24%	29%	33%	53%	43%
NEG	21%	29%	37%	42%	35%	35%
EG	16%	24%	18%	54%	46%	44%

Table 7: % of participants for the different groups that selected a number of identical ideas and the % that chose their own idea.

	ENTREPRENEUR RATINGS				SPECIALIST RATINGS				OWN IDEA
# IDENTICAL ANSWERS	**0**	**1**	**2**	**3**	**0**	**1**	**2**	**3**	
CG	31%	57%	10%	2%	14%	45%	39%	2%	-
NEG	33%	50%	15%	2%	31%	29%	39%	2%	25%
EG	48%	46%	6%	0%	4%	58%	28%	10%	34%

4.4 Correlational effects of the evaluations on the selection

This section is an explanation on how the evaluations of the ten products affect the idea selection performance. In the survey the participants are asked to rate all of the ten products on a scale on 1 to 10 on innovativeness. The ratings are represented as the evaluations. After gathering all the data related to the evaluations, the deviating rating is computed for every ten products and every participant. The ratings of every participant are compared with those of the experts for every of the ten products by extracting them of each other. See table 20 (appendix) for the ratings of the experts. The deviating rating is then computed as the sum of deviations for all the ten products. Finally, the deviating rating is put against the ISS in a scatterplot for the entrepreneur – and specialist ratings to see if a correlation exist.

Figure 2 depicts the scatterplot for the deviating rating for the entrepreneur (DRENT) on the ISSENT. For a scatterplot it holds that the closer the data points come to forming a straight line, the higher the correlation between the two

variables. The dots in this case are all over the place, so there is no evidence to say that there is a strong relationship between the ISSENT and DRENT. A small decreasing effect can be seen in the line, however the R-squared 0.004 of the plot also indicates to a low correlation between the evaluations of participants and their selection performance. A decreasing line implies that as the DRENT increases the ISSENT decreases, but this statement is weakened by the results. The same can be said for the relation between the DRSPE and ISSSPE (figure 3). There is almost no correlation between the variables as the dots are spread all over the graph. The R-squared is this time higher with 0.006, but still insignificant to say a strong relationship exist between the evaluations and the selection performances based on the specialist ratings.

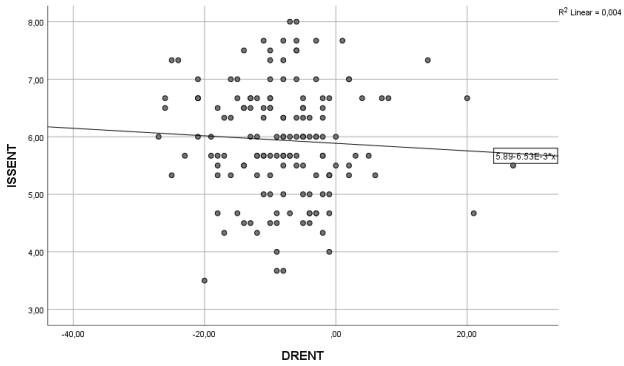


Figure 2: Scatterplot for the DRENT and the ISSENT

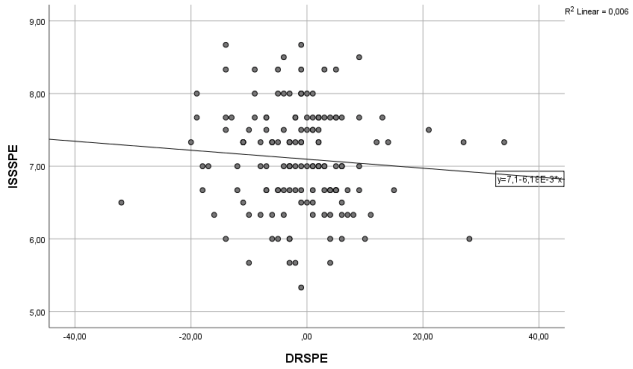


Figure 3: Scatterplot for the DRSPE and the ISSSPE

Overall, it can be concluded that a very low relationship exists between the variables “Deviating Rating” and “ISS”. In other words, there is almost no relationship between the evaluations of participants and their idea selection scores. So, it does not necessarily have to hold that someone who is exceptional in evaluating ideas also selects the best ideas, or vice versa.

4.5 Own idea evaluations along the survey

The following chapter discusses how participants have rated their own ideas along the survey. Therefore, this section only applies for the NEG and the EG, since the CG did not generate and rate their ideas. The NEG rated their own idea two times in the survey, of which one directly after the idea generation and the other after the selection process. The EG rated their idea one additional time, which is after the manipulation of seeing that their idea is evaluated with the grade 8. Table 7 showed us previously that participants in the EG chose their own idea with an additional 7% compared to the NEG, which is expected to be because of the participants getting more confident in their idea.

4.5.1 Non-Exposure Group

The next thing that is displayed is the difference in own idea evaluations over the moments along the survey. The following figures show if participants rated their own idea lower, equal or higher compared to their other ratings. For the NEG, almost half of the participants seem to have rated their own idea lower at moment 2 relatively to moment 1 (see figure 4). Moment 1 is here the rating after the generation and moment 2 the rating after the selection. 29% rated it equally high and only 25% rated it higher. It is assumed that after seeing the selection of ten ideas, one starts doubting the value of their own idea, since there are much better ideas among them.

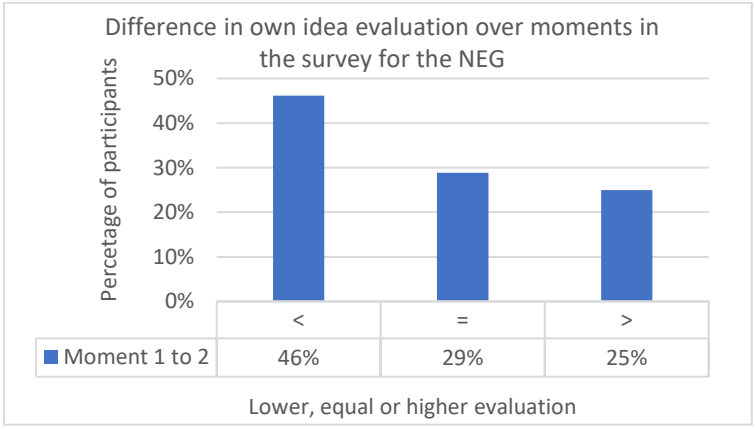
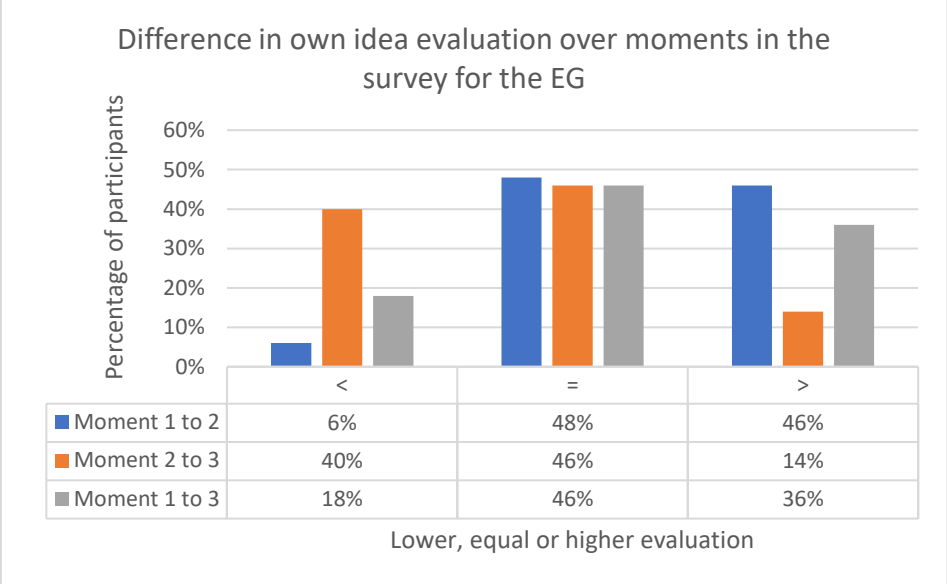


Figure 2: Difference in own idea evaluation along the survey for the NEG

4.5.2 Exposure-Group

For the EG, the same effects are measured over three moments (figure 5). Moment 1 refers to the rating after generation, moment 2 to the rating after manipulation and moment 3 to the rating after selection. It can be deduced that for all three moments almost half of the respondents rated their own idea equally high. On top of that, 46% of the respondents has given a higher rating to their idea after the manipulation compared to after generation. This is expected as it is assumed that the manipulation makes respondents more confident in their own idea and in accordance rate their idea higher. Then, for moment 2 to 3 a decrease of 40% is measured in their ratings. As mentioned earlier, it is believed that this is due to the self-doubting after seeing the ten ideas. Even so, the decrease from moment 2 to 3 has not led to an overall decrease of the ratings, since the ratings from moment 3 seem to be higher with 36% compared to moment 1. Thus, the positive effect of overconfidence can be higher than the negative effect after selection, according to the stated theories.



	<	=	>
Moment 1 to 2	6%	48%	46%
Moment 2 to 3	40%	46%	14%
Moment 1 to 3	18%	46%	36%

Figure 3: Difference in own idea evaluation along the survey for the EG

4.6 Including one's own idea in the to be selected ideas

This section conducts an independent sample t-test to find how including one's own idea in a pool of others' ideas, of which participants select their top 3 ideas, does impact the ability to identify high-quality ideas. This is done through examining the equality in means for the ISS between participants that are involved in the generation process and those who are not, as those who are involved also can select their own idea. The ISS of both experts are taken into account. In this case it is a comparison of the CG versus the NEG and EG together. The group statistics are shown in table 8, in which the CG is represented by the value 0 and the NEG and EG by 1.

Table 8: Group statistics for the CG versus the NEG and EG

	Gen	N	Mean	Std. Deviation	Std. Error Mean
ISSENT	0	51	5,9125	1,02316	,14327
	1	100	5,9538	,94588	,09459
ISSSPE	0	51	6,9478	,70951	,09935
	1	100	7,1835	,66694	,06669

Then, for the actual statistics of the t-test, table 9 illustrates the results. As for the Levene's test of equality, a non-significant effect is observed as is F=0.391 with a p-value of 0.533 and F=0.030 with a p-value of 0.862 for respectively the ISSENT and ISSSPE. The p-values are higher than the 5% significance level. This means that equal variances are assumed and that for controlling the significance of the t-test, the p-values of 0.806 (ISSENT) and 0.046 (ISSSPE) have to be used. Yet again, this p-value is higher than the 5% significance level for the ISSENT, which is the reason for stating that there is no proof to conclude that including one's own idea in a pool of others' ideas, of which one should select their top 3, affects the ISS for the entrepreneur significantly. However, the p-value for the ISSSPE indicates the opposite. In this case there is enough evidence to state that adding

your own idea in a pool of other ideas influences the ISS for the specialist, and thus also the selection performance.

Table 9: Independent sample t-test statistics for the CG versus the NEG and EG with the dependent variables ISSENT and ISSSPE.

		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
ISSENT	Equal variances assumed	,391	,533	-,247	149	,806	-,04125	,16734	-,37191	,28941
	Equal variances not assumed			-,240	94,061	,811	-,04125	,17168	-,38212	,29962
ISSSPE	Equal variances assumed	,030	,862	-2,010	149	,046	-,23566	,11727	-,46738	-,00393
	Equal variances not assumed			-1,969	95,429	,052	-,23566	,11966	-,47320	,00189

To test whether the relationship is positive or negative for the specialist ratings, it is decided to conduct a simple regression. Table 10 shows the results and it can be derived that a positive relationship exists between involving one's own idea for the NEG and EG together on the ISSSPE as the coefficient is 0.236. So, including one's own idea in a pool of others' ideas has a positive significant effect on the idea selection performance based on the specialist ratings for the NEG and EG together.

Table 10: Simple regression for involvement in generation on ISSSPE.

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	6,948	,095		72,804	,000
	Gen	,236	,117	,162	2,010	,046

a. Dependent Variable: ISSSPE

With this, the second sub-question of this study, which says "How does including one's own idea in a pool of others' ideas impact the ability to select high-quality ideas?" is answered. The results seem to change per for different experts. Overall, this implies that the mean scores between the CG versus the NEG and EG do not significantly differ from each other for the entrepreneur ratings, but do differ for the specialist ratings. Apparently adding one's own idea to a pool of ideas seem to influence the idea selection performance positively.

4.7 The role of experience

Another independent samples t-test is performed to see whether the role of experience influences the ISS. Since this research does not focus on the higher-levels in a company, the two groups that are compared are the unemployed and the lower-levels. The unemployed are depicted by the value 0 and the lower-levels by 1 in table 11.

Table 9: Group statistics for the unemployed and lower-levels.

	Employment	N	Mean	Std. Deviation	Std. Error Mean
ISSENT	0	60	6,0315	1,05384	,13605
	1	91	5,8795	,91052	,09545
ISSSPE	0	60	6,9862	,74134	,09571
	1	91	7,1815	,64357	,06746

Here follow the results (see table 12) and interpretation of the t-test. The Levene's test of equality is again non-significant for both the ISSENT (F=0.917, p-value of 0.340) and ISSSPE (F=1.027, p-value of 0.313), so equal variances are assumed. Therefore, the appropriate p-values for the t-statistics are 0.347 for the entrepreneur ratings and 0.088 for the specialist ratings. Since this p-values are greater than the 5% significance level it is concluded that there is no evidence to claim that being a lower-level employee, relatively to the unemployed influences the ISS significantly, and vice versa. The mean scores between the unemployed

and the lower levels do not significantly differ from each other, which provides an answer to the third sub- question of the study "what is the role of experience on the ideation process?". Apparently, the employment status plays no role in the ideation process when talking about only the lower-levels and the unemployed.

Table 10:Independent sample t-test statistics for the unemployed and lower levels.

		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
ISSENT	Equal variances assumed	,917	,340	,943	149	,347	,15205	,16128	-,16664	,47074
	Equal variances not assumed			,915	113,368	,362	,15205	,16619	-,17720	,48130
ISSSPE	Equal variances assumed	1,027	,313	-1,718	149	,088	-,19537	,11374	-,42013	,02938
	Equal variances not assumed			-1,668	113,784	,098	-,19537	,11709	-,42734	,03660

4.8 Selecting between one's own and others' ideas

Next on, an independent sample t-test is conducted for the NEG and the EG to explore if there is a significant difference in the ISS of the experts between the respondents that have chosen their own idea in their top 3 and the respondents that did not. An extra variable is created that takes the value 0 if the participants have not chosen their own idea and the value 1 for those who have chosen their own idea. The dependent variables are again the ISSENT and ISSSPE

4.8.1 In the NEG

Table 13 refers to the group statistics for the NEG. The actual t-test statistics are shown in table 14. The Levene's test of equality is not significant for the ISSENT (F=3.535 with P>.05) and the ISSSPE (F=0.023 with P>.05). This means that equal

variances are assumed, which is why the upper row has to be taken into account for controlling the significance of the t-tests. It can be extracted from the table that, the p-value for the assumption of equality of means is 0.010 for the ISSENT and thus lower than the significance level of 0.05. This indicates that there is enough evidence to say that including one's own idea in an idea selection does affect the ISS significantly. This is not true for the ISSSPE, since the p-value of 0.997 is higher than the significance level of 5%. So, the mean scores between the groups that have and have not chosen their own idea are significantly different for the expert ratings in the NEG, but not for the specialist ratings in the NEG.

Table 11: Group statistics for the NEG

	OwnIdea NEG	N	Mean	Std. Deviation	Std. Error Mean
ISSENT	0	37	5,9100	,91034	,14966
	1	13	6,6400	,57653	,15990
ISSSPE	0	37	7,1670	,73207	,12035
	1	13	7,1662	,69068	,19156

Table 12: Independent sample t-test statistics for the NEG

		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
ISSENT	Equal variances assumed	3,535	,066	-2,697	48	,010	-,73000	,27064	-1,27416	-,18584
	Equal variances not assumed			-3,333	33,630	,002	-,73000	,21901	-1,17526	-,28474
ISSSPE	Equal variances assumed	,023	,879	,004	48	,997	,00087	,23277	-,46713	,46888
	Equal variances not assumed			,004	22,191	,997	,00087	,22623	-,46807	,46981

A simple regression is conducted in order to test how choosing one's own idea above others' ideas affect the idea selection performance for the ISSENT in

the NEG. The results are shown in table 15. The variable ISSENTneg is the ISSENT for the NEG and OwnIdeaNEG takes the value 1 for those who selected their own idea above others and 0 otherwise. It can be deduced that a positive significant effect exists for choosing your own idea above others' ideas as the coefficient is 0.730. The key take-away is here that choosing your own idea increases the idea selection performance for the ISSENT in the NEG.

Table 13:Simple regression for OwnIdeaNEG on the ISSENTneg

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5,910	,138		42,826	,000
	OwnIdeaNEG	,730	,271	,363	2,697	,010

a. Dependent Variable: ISSENTneg

4.8.2 In the EG

For the EG, table 16 refers to the group statistics. The t-test statistics for this group are to be retrieved from table 17. The Levene's test of equality is again not significant for ISSENT (F=0.744 with P>.05) and ISSSPE (F=0.061 with P>.05), thus equal variances are assumed. The p-values of the t-tests take respectively the value 0.360 and 0.676, which are greater than the significance level of 0.05%. The assumption of equality of means is therefore rejected. This implies that there is not enough evidence to say that including one's own idea in an idea selection does affect the ISS for both experts significantly for the EG. In other words, the mean scores for the EG between those that have and have not chosen their own idea do not significantly differ from each other.

Table 14: Group statistics for the EG

	OwnIdea EG	N	Mean	Std. Deviation	Std. Error Mean
ISSENT	0	33	5,9003	,95657	,16652
	1	17	5,6282	1,04228	,25279
ISSSPE	0	33	7,2270	,61934	,10781
	1	17	7,1482	,64447	,15631

Table 15: Independent sample t-test statistics for the EG

		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
ISSENT	Equal variances assumed	,744	,393	,924	48	,360	,27207	,29435	-,31977	,86390
	Equal variances not assumed			,899	30,067	,376	,27207	,30271	-,34608	,89022
ISSSPE	Equal variances assumed	,061	,806	,420	48	,676	,07873	,18743	-,29812	,45559
	Equal variances not assumed			,415	31,303	,681	,07873	,18988	-,30838	,46585

As answer to the research question "How does selecting between one's own idea versus others' ideas influence the idea selection performance?", it can be said from the data that selecting between one's own idea and others' ideas does not significantly influence the idea selection performance for the EG and for the ISSSPE in the NEG. However, for the ISSENT in the NEG a significant positive effect is found for selecting between one's own idea and others' ideas. So, for specific cases, one should account for circumstances in which own idea selection can influence the idea selection performance.

5. Conclusion and Discussion

5.1 General Discussion

This study investigates how selecting between an own idea versus others' ideas influences the idea selection performance and then focuses on the effect of different variables on the idea selection performance. These variables include being in the CG, NEG or EG and adopting an optimistic attitude and being competitive. Additional control variables that are checked upon are gender, age, education and employment. The main finding regarding the research question is that, on the one hand, selecting between an own idea and others' ideas have no significant effect on the idea selection performance for the EG and for the ISSSPE in the NEG. On the other hand, for the ISSENT in the NEG a significant positive effect is found for selecting between an own idea and others' ideas. This means that for specific cases it is possible that selecting one's own idea increases the idea selection performance. An explanation for this phenomenon can be that those who select their own idea are more confident in their decision to be the right one. This will cause them to adopt a non-hesitant behavior. In turn, when they can choose more than one idea, they judge others' ideas to be good or bad without hesitation which can increase the idea selection performance. Hence, the theory behind this is that the less someone hesitates, the less this person is bound to fail in selecting the right ideas.

For the answer on the sub-question "which factors influence the innovation selection process?", it is concluded that according to prior research certain approaches help to contribute to the selection process. Some of those are tools, such as the risk matrix and the R-W-W screen (Day, 2007), while others include an adoption of positive beliefs (Yuan & Woodman, 2010), emphasizing past individual achievements (Goncalo & Duguid, 2008) and direct group communication (Dahan et al., 2011). Also, manipulations in experiments that give more instructions can

improve the quality of the selected ideas (Rietzschel et al., 2014). Lastly, under particular circumstances it helps to apply a centralized operation system about decision-making to the lower-levels of a firm (Hutchison-Krupat & Kavadias, 2015).

Regarding the second sub-question, the mean scores between the CG versus the NEG and EG do not significantly differ from each other for the entrepreneur ratings. So, there is no evidence for including one's own idea in a pool of others' ideas to have a significant effect on the idea selection performance for these groups. On the contrary, for the specialist ratings it seems to differ and adding one's own idea to a pool of ideas seem to influence the idea selection performance positively.

For the third sub-question, no significant effect is found to exist between the unemployed group and lower-levels group. In other words, the employment status has no impact on the idea selection performance.

Regarding the conceptual model, all hypotheses and their effects are rejected, since for all hypotheses, except for h3, there is no significant effect of any of the variables on the idea selection performance. Hypothesis 3 is also rejected for the entrepreneur ratings, not because INV*OPT has not a significant effect on the idea selection performance, but contrary to what is expected, a negative rather than a positive relationship exists between being in the INV*OPT and the idea selection performance compared to the CG. For the specialist ratings, again, no effect exist which is why h3 is rejected. A possible explanation for the negative effect of INV*OPT may be that the participants who are in the NEG (rather than the CG) and who adopt a positive attitude get too attached to their own idea that they start to unsee the value of others' ideas. This attachment would not necessarily have to have roots in feelings of greed and jealousy towards the others'

ideas, but rather extreme positivism towards one's own idea. This can bias them only for them to become more reckless when rating and selecting ideas. Finally, it is concluded that for the entrepreneur ratings males perform worse in idea selection compared to females.

The last remark is about the correlation of the evaluations of the ten products on the idea selection performance. This is a contribution to the study as, with this, it investigates the whole ideation process: from idea generation to idea evaluation to idea selection. Generally, it is derived that there is almost a non-existent relationship between the idea evaluations and the idea selection. With this, the conclusion is reached that someone who is exceptional in evaluating ideas does not always select the best ideas, or vice versa. A reason for this may be that several ideas can be rated with the same score, but when one can only select a limited set of ideas, the wrong ones are selected. On the contrary, it may also perfectly be possible that the right ideas are just chosen on a whim.

5.2 Academic Contribution

Existing literature about the idea selection process is scarce compared to that of the idea generation process. This research contributes to prior literature by offering new insights about the idea selection process in four ways.

First of all, a contribution to the existing literature on the subject around creative forecasting of Berg (2016) in his first experiment, are the results about selecting between one's own idea and others' ideas. The conclusion is derived that selecting one's own idea above others' ideas for the ISSENT in the NEG increases the idea selection performance. On top of that, the research finds new evidence on the fact that including one's own idea in a pool of others' ideas does have a significant positive effect on the idea selection performance for the specialist ratings. This is not the same as being involved in idea generation.

Secondly, the research presents a new perspective on the creativity paradox by identifying that the idea generators in the group without the fake-statement manipulation are not suitable for making end-decisions about the best possible idea if they are adopting a positive attitude. This group of idea generators seem to decrease the idea selection performance. This is again a contribution to the work of Berg (2016) on manager versus creator roles, specifically to his second experiment. Generally, males perform worse in the idea selection process relatively to the females for the entrepreneur ratings. Furthermore, the study provides insights on the fact that individuals in groups in generator roles are not necessarily better than individuals in the non-generator roles in selecting the best novel ideas.

Thirdly, the results shed light on the fact that being extraordinarily good in evaluating ideas does not have to imply that the idea selection process goes without problem. Regarding the whole ideation process, neither involvement in idea generation nor idea evaluation are impacting idea selection significantly. This can be an extension on the work of Hooshangi and Loewenstein (2018) that investigate how generating ideas distort the business decisions of entrepreneurs. Individuals who generate ideas seem to create biased evaluations of economic potential of ideas, regardless of the idea being their own or of someone else. This might as well be the case for the idea evaluations in this study.

Last but not least, on an academic level this study contributes to the literature as it is found that exposure to feedback on generation performance does not affect the idea selection performance significantly. So, being exposed also does not have to imply that someone performs worse on the idea selection performance. The same goes for all the moderation effects, except INV*OPT. This is contrary to the study of Goncalo & Duguid (2008) that states that managers

should highlight the past successes of their co-workers in order to make more accurate decisions and increase the quality of the decision.

5.3 Managerial Implications

Based on the results of this study four main implications can be given to the people of managerial ranks. Firstly, do not let employees of the lower level who are involved in the idea generation process and who are adopting a positive attitude make decisions about selecting the best ideas out of a pool of ideas. In contrast to the expected, involvement in idea generation when being optimistic makes people select worse than those who are not involved in idea generation. Specifically, regarding who to include in the selection process, managers should ask only the non-idea generators to select ideas if they are aiming to increase the probability of choosing the idea of the best quality.

Secondly, in specific cases it is possible for the idea generator to have to select anyway, for example when a firm is out of manpower. In these circumstances managers should definitely include the decision-maker's own idea in the pool of ideas, since it does have a significant positive effect on the idea selection performance for the specialist ratings. In other cases, like for the entrepreneur ratings it has no effect, but this means there is also no negative effect. This means that the idea selection performance cannot decrease, but in some cases it can increase.

Thirdly, as it is found that exposure to idea generation performance does not affect the idea selection performance, managers should not invest their valuable time in making their employees feel confident about their past generation performances, since it does not create any value at all for the selection process. Generally speaking, managers often try to invest in ideas and projects that are, on the short – or long term, profitable. It would be a waste to put time

and energy in something that is not returning its value, while there are better projects that can be invested in. This is the basic concept of an increase in opportunity costs, otherwise a potential benefit an individual, investor, or business misses out on when choosing one alternative over another.

Fourthly, as evaluating ideas has no relation to the idea selection performance, managers should not necessarily base their decisions on the best idea on how well they evaluated previous ideas that came to fruition in the market. Like discussed before, it may well be that their past successes are because of sheer luck, as it is possible that they rate several ideas the equally high and that they are then picking just the right one.

5.4 Limitations and Directions for Future Research

This section mentions some limitations that this research has faced when conducting the experiment. Firstly, it is unknown what causes the difference in idea selection performance between groups. It may be due to the ability of participants to select better than other groups, but it also may be because of the stimuli and fatigue-effects of the surveys as the surveys are not equal in length for the three groups. The difference in the length of the surveys may have influenced the outcomes, so it is recommended to take this into account for future researches and avoid this incident.

The second limitation is in the definition of the lower levels within a firm. This concept can be interpreted in different ways and thus may be too restricted in their definition to understand what is referred to as the lower levels. Participants may not have fully understood the concept and can choose the wrong option in the experiment that is conducted in this study. This can have resulted in biased answers and, even more, in valuable data to be removed from the data set, because it does not meet the requirements. Future research may want to solve

this problem by offering a wider and more comprehensive definition of the employment statuses that can be selected.

As for the third limitation, future studies can implement a stronger incentive for participants to fill in the survey, so they make sure they complete the survey and have more volunteers. For example, sharing a gift-card or certain amount of money to random participants will increase the willingness to participate in the survey.

Lastly, certain problems may have emerged regarding the effects of the moderators in this study, i.e., adopting an optimistic attitude and being competitive. These variables are measured through the statements of the participants thinking to be positive and/or competitive. In other words, it may be said that the answers filled in by the participants are related to their perceived self-image of them regarding being optimistic and competitive and not necessarily on their real attitudes. Future research may want to find a way to also measure their actual attitudes and compare this in contrast to their perceived attitudes.

6. Appendix

6.1 Experiment set-up

Table 16: Experimental Survey

#	CG	NEG	EG	Question	Type of Question	Description
PART 1				**IDEA GENERATION**		**IDEA GENERATION**
1.0				Welcome to this experiment! We're conducting research on the ability of people to select the best innovative idea out of a pool of ideas. The survey only takes 10 minutes on average. If you are willing to receive the outcomes of the experiment, please leave your e-mail address behind. Your responses will be treated carefully and are completely anonymous. We really appreciate your input, thank you for your participation!	Introduction & Open Question	example@hotmail,com
1.1				Innovation plays a huge part in our daily lives as it helps us in doing our daily tasks with much more ease. Think about the first introduction of the washing machine or the thermos that keeps your drinks warm. It is your task to come up with one innovative idea that will ease your life at home. You can take as many minutes as you need. Please describe your idea within 100 words. Think for instance of specific rooms like the kitchen, bathroom, living room, bedroom or garden.	Open Question	Use max. 100 words. (Uploading picture is possible)

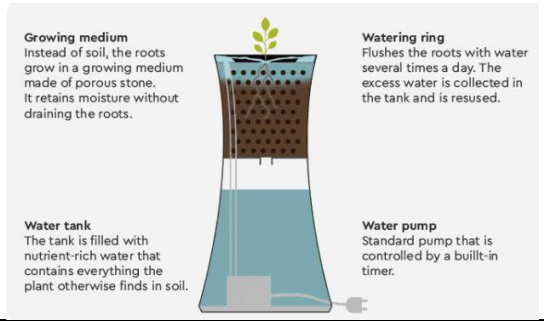
				Upload an image that represents your product. (optional)		
1.2				Thank you for the submission of your idea. Your idea will be evaluated on a scale from 1 to 10 on innovativeness by a software that detects high-quality ideas. The software is developed by an external company called Intelligent Connection that is willing to help us in our study to contribute to our understanding of the idea selection process. The grade on your idea will be projected on the screen as soon as it is rated. Please answer the following questions while waiting for the result.	Additional information	
1.3				On a scale of 1 to 10, how innovative do you think your idea is?	Likert Scale	Integer scale from 1 to 10
1.7				Select your gender	Multiple Choice	Male/ Female
1.8				Enter your age in numbers	Open question	Age in numbers
1.9				Select your highest level of education obtained	Multiple Choice	Elementary school/ High-school/ Secondary education (MBO)/ Higher education (HBO/ WO Bachelor/ WO Master)/ Doctorate
1.10				Considering the hierarchy for the firm you are working for, at which organizational level of this hierarchy are you?	Multiple Choice	Higher-Level/ Middle-Level/ Lower-Level/ Unemployed

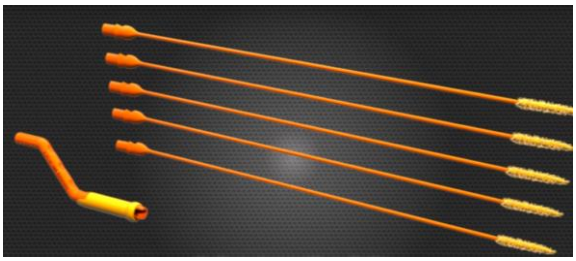
1.11				Select in how far you agree with the following statements: 1. I keep a positive attitude that things always turn out all right. 2. I prefer to think about the good things that can happen rather than the bad. 3. When thinking over my decisions I focus more on their positive end results.	Matrix table	Totally disagree/ Disagree/ Neutral/ Agree/ Totally agree
1.12				Select in how far you agree with the following statements: 1. I enjoy working in situations involving competition with others. 2. It is important to me to perform better than others on a task. 3. I feel that winning is important in both work and games. 4. I try harder when I am in competition with other people. 5. Being # 1 is important to me.	Matrix table	Totally disagree/ Disagree/ Neutral/ Agree/ Totally agree
PART 2				**EXPOSURE**		**EXPOSURE**
				Your results are progressed and will be shown in a few seconds.	Additional information	
				We are done evaluating your idea! It is concluded that, overall, your idea is worth rating 8 out of 10 points! Thank you for your efforts!	Additional information	

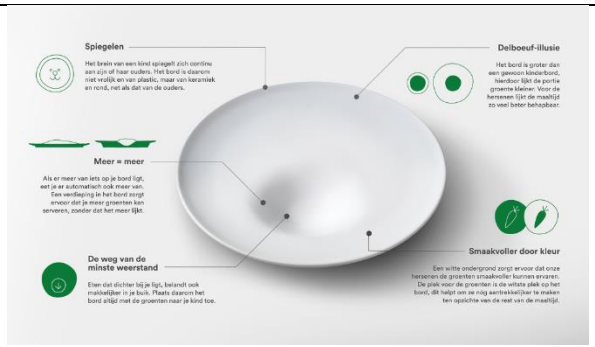
2.1				On a scale of 1 to 10, how innovative do you think your idea is now?	Likert Scale	Integer scale from 1 to 10
PART 3				IDEA SELECTION		IDEA SELECTION
				Here follow 10 pictures of innovative products and their descriptions. Please rate each idea on innovativeness on a scale from 1 to 10.	Additional information	
3.1				Product 1 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.2				Product 2 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.3				Product 3 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.4				Product 4 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.5				Product 5 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.6				Product 6 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.7				Product 7 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.8				Product 8 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.9				Product 9 (see table 19)	Likert Scale	Integer scale from 1 to 10
3.10				Product 10 (see table 19)	Likert Scale	Integer scale from 1 to 10

3.11				Please select your top 3 ideas. You are allowed to choose your own idea as well (only treatment – and manipulation group).	Multiple Choice	Ideas 1 to 10 + own idea
3.12				On a scale of 1 to 10, how innovative do you think your idea is now?	Likert Scale	Integer scale from 1 to 10

Table 17: Product images and their descriptions in part 3 of the survey.

Product	Image	Description
1. Botanium	 	Are you an expert in killing plants? With Botanium you don't have to wonder if your plant gets enough water. It is an automatic and self-watering hydroponic planter. Hydroponics involve growing plants without soil by using mineral nutrients. Just fill the tank and it will take care of the plant for you. It will regularly water the plants and excess water goes back in the tank automatically. That means it will never be too little or too much watered. A full tank will last for a month, so you don't need to worry if you go away.
2. Water purifier bottle		Unrivaled Ease, Speed & Convenience. No other purifier rivals the speed, simplicity and effectiveness of GeoPress. In eight seconds, it makes 24 ounces (710 ml) of safe, clean drinking water anywhere on earth. Tap into the world's water sources and safely drink from sketchy spigots, hotel sinks, murky rivers, wells or lakes. GeoPress protects from global waterborne pathogens (virus, bacteria, protozoan cysts), pesticides, chemicals, heavy metals, and even microplastics. *Also improves taste, smell, and clarity!*

3. Clocky		The alarm clock on wheels. Never oversleep again. You can snooze once but then Clocky will jump off of your nightstand, and run around beeping, determined to get you out of bed. So, you HAVE to get out of bed to turn it off. Heavy sleepers wake up energized and say this hilarious clock is the only thing that can actually get them up and moving on tired mornings. Ofcourse let's not forget about its cute design.
4. The drain weasel		The instant clog remover drain weasel. With 360-degree rotation, extra-long- and flexible design, the Weasel pipe snake effectively tackles your biggest clogs in your drains. The secret is the incredible patented micro-hooks, which locks into hair, filth and grime without damaging your pipes or catching on drain parts by turning the handle. The parts are also re-usable.
5. Allergy Amulet		An allergen sensor that saves you from the fear of eating something bothersome. The number of people with food allergies and intolerances is on the rise. A disposable test strip is developed which enables you to test whether the food you're about to eat has a potential allergen in it. You insert food into the sampler and turn to grind it. Connect the sampler to the amulet. The amulet displays whether allergens are present.

6. Waterproof matches		Stormproof, waterproof and windproof matches with 15 seconds burn-time. Matches are completely stormproof and burn despite wind or rain. It will also burn underwater
7. CleanseBot		CleanseBot is a pocket-size smart robot that is designed to sanitize and disinfect any surface using UV-C light including beds, blankets, cellphones, keyboards and kitchen and bathroom surfaces. With its high-tech wheels it can climb over non-straight spots and it won't fall off of the bed as it detects the distance as far as it can go.
8. Lua-pot		Lua gives plants a face, showing them what they need. This way it is easier to actually keep them alive. It shows different emojis when having too little/much water or sunshine and when it is too cold or warm. By scanning the QR-code in the app it detects the type of plant and accounts for this when telling you what it needs.
9. The plate		With this plate your kid would actually finish their vegetables. Even when it looks like a normal plate, it is scientifically proven that this plate contributes to improved eating habits. It creates the Delboeuf illusion which means that the plate is larger than average, making the portion of vegetables on the plate appear smaller.

		The dimple in the plate makes the vegetables increase without taking more space on the plate and, thus, does not discourage people to finish the plate. The white surface of the plate also seems to attract people when eating vegetables.
10. Stixfresh		Fruit is now longer fresh with a sticker. This innovation fights the global food problem and help households and firms to save money on wasted food. Fruit can be kept fresh for fourteen days longer thanks to the ingredients that slow down the ripening process. These ingredients are all natural. It works especially good on apples, oranges, avocados and mangos.

6.2 Explanatory figures and tables

Table 18: Product ratings of the experts

Product Ratings	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Average
Entrepreneur	6	3	2	7	6	7	2	9	8	6	5,6
Specialist	9	7	5	4	7	6	3	5	7	10	6,3

Table 19: Descriptive statistics of all variables

	N	Minimum	Maximum	Mean	Std. Deviation
ISSENT	151	2,50	8,50	5,8160	1,19214
ISSSPE	151	4,00	9,50	7,0886	1,13590
Control	151	0	1	,32	,470
INV	151	0	1	,34	,477
Exp	151	0	1	,33	,472
INV_OPT	151	,00	4,70	1,2974	1,85576
INV_COMP	151	,00	4,80	1,0993	1,58070
EXP_OPT	151	,00	5,00	1,1623	1,71856
EXP_COMP	151	,00	5,00	1,1099	1,65806
Male	151	0	1	,49	,502
Education	151	1	5	3,54	,719
Age	151	17	40	23,07	4,263
Employment	151	0	1	,60	,491
Valid N (listwise)	151				

6.3 Assumptions of Multiple Linear Regression

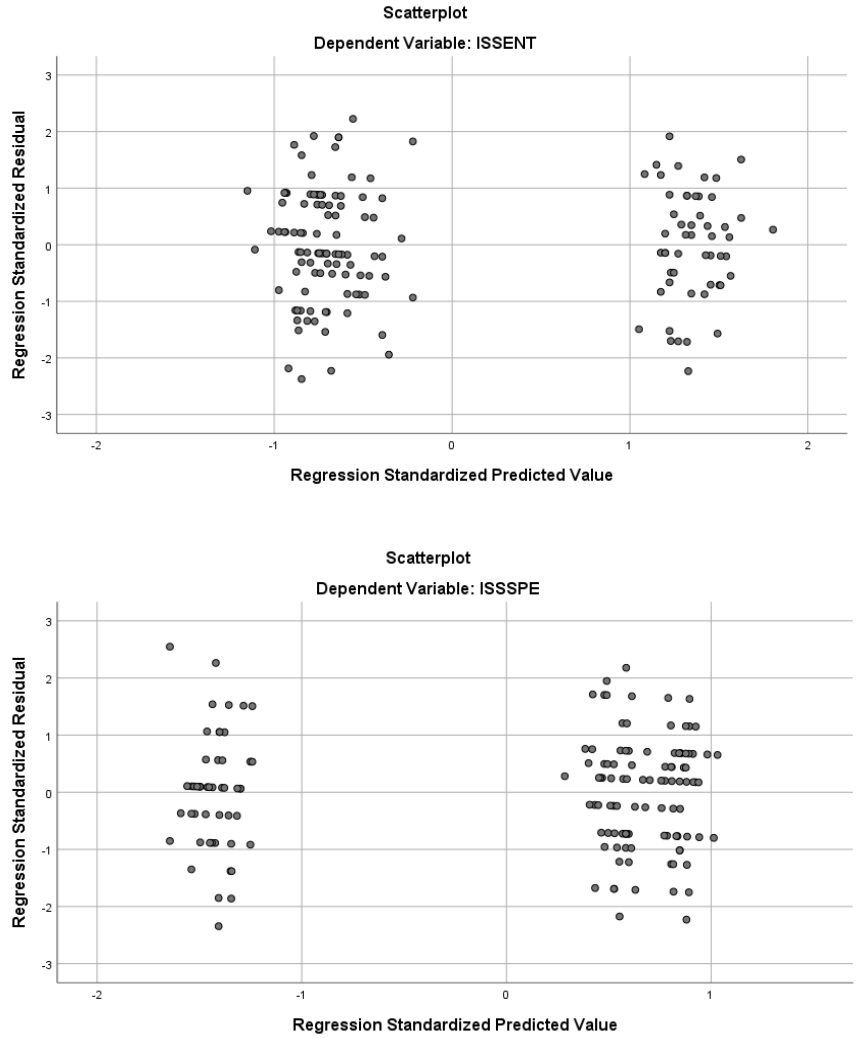


Figure 4: Assumption for homoscedasticity for ISSENT and ISSSPE

Table 20: Test of Normality for ISSENT and ISSSPE

Tests of Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
ISSENT	,983	151	,061
ISSSPE	,981	151	,052

a. Lilliefors Significance Correction

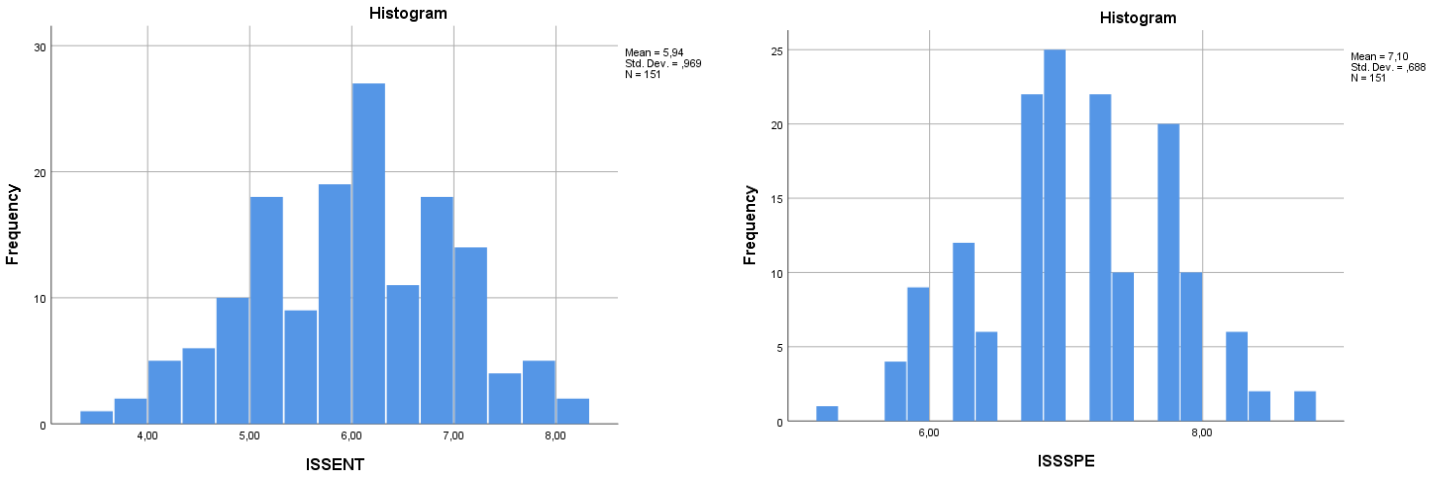


Figure 5: Histograms for ISSENT and ISSSPE on normality

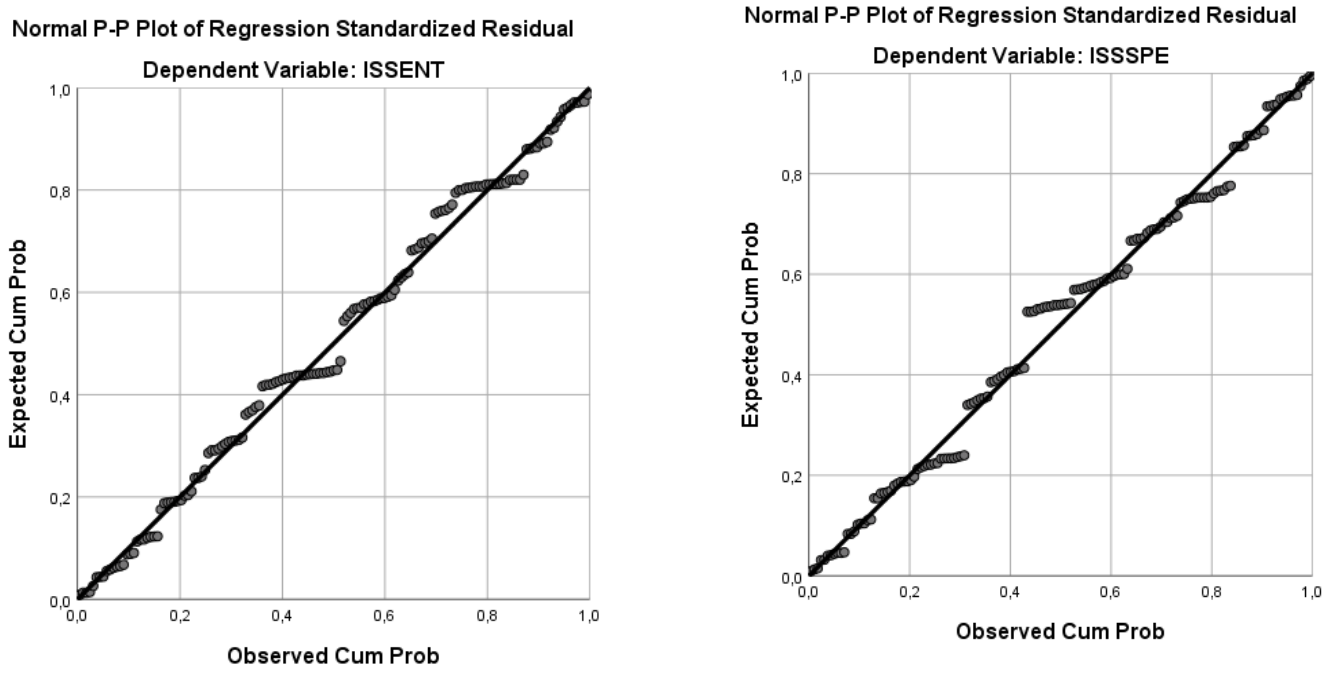


Figure 6: Assumption for a linear relationship between the dependent and independent variables for ISSENT and ISSSPE

Table 21: Assumption on multicollinearity for ISSENT and ISSSPE

Correlations

		ISSENT	Control	INV	Exp	OPT	COMP
Pearson Correlation	ISSENT	1,000	-,076	,170	-,096	,008	-,033
	Control	-,076	1,000	-,502	-,488	-,127	-,003
	INV	,170	-,502	1,000	-,510	,179	-,066
	Exp	-,096	-,488	-,510	1,000	-,055	,070
	OPT	,008	-,127	,179	-,055	1,000	,160
	COMP	-,033	-,003	-,066	,070	,160	1,000

Correlations

		ISSSPE	Control	INV	Exp	OPT	COMP
Pearson Correlation	ISSSPE	1,000	-,163	,063	,099	,027	,014
	Control	-,163	1,000	-,502	-,488	-,127	-,003
	INV	,063	-,502	1,000	-,510	,179	-,066
	Exp	,099	-,488	-,510	1,000	-,055	,070
	OPT	,027	-,127	,179	-,055	1,000	,160
	COMP	,014	-,003	-,066	,070	,160	1,000

Table 22: Coefficients of the VIF for ISSENT and ISSSPE

Model		VIF
1	(Constant)	
	Control	1,360
	Exp	1,350
	OPT	1,067
	COMP	1,038

a. Dependent Variable: ISSENT

Model		VIF
1	(Constant)	
	Control	1,360
	Exp	1,350
	OPT	1,067
	COMP	1,038

a. Dependent Variable: ISSSPE

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